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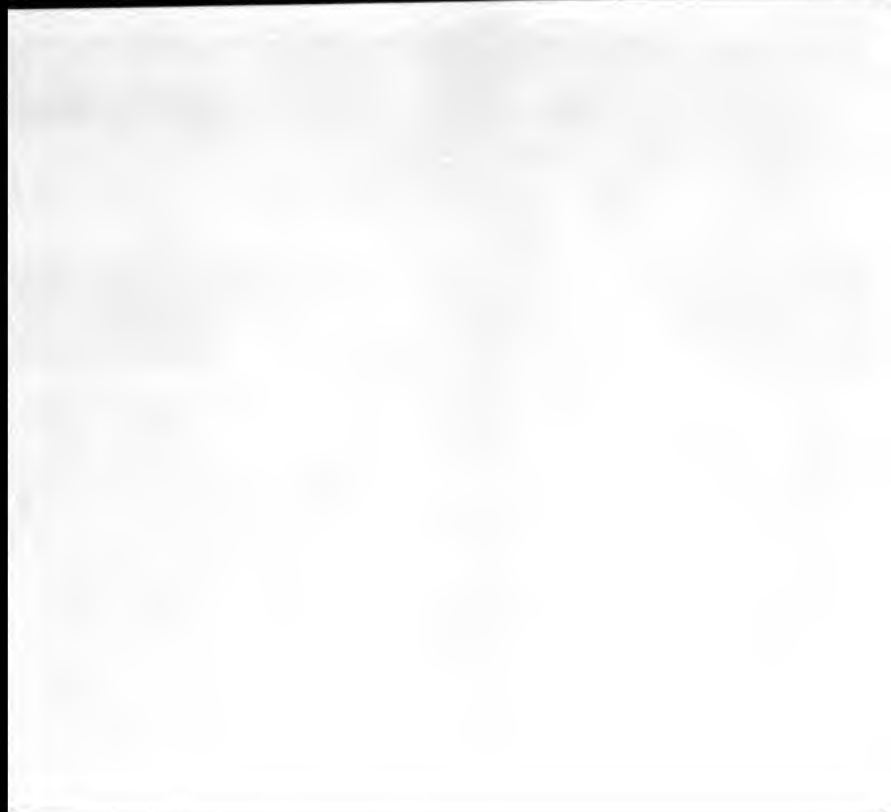
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THE CAR-BUILDER'S DICTIONARY:

+ AN ILLUSTRATED VOCABULARY OF TERMS
WHICH DESIGNATE AMERICAN RAILROAD
CARS, THEIR PARTS AND ATTACHMENTS. +

COMPILED FOR THE MASTER CAR-BUILDERS' ASSOCIATION

By MATTHIAS N. FORNEY, *Mechanical Engineer,*

ASSISTED BY

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And CALVIN A. SMITH, *Secretary of the Master Car-Builders' Association.*

REVISED AND ENLARGED EDITION.

TO WHICH HAS BEEN ADDED A VOCABULARY OF THE LEADING TERMS USED IN ENGLISH RAILWAY CARRIAGE
AND WAGON CONSTRUCTION.

Compiled by A. M. WELLINGTON, C. E.,

ASSISTED BY MEMBERS OF THE EXECUTIVE COMMITTEE OF THE MASTER CAR-BUILDERS' ASSOCIATION.

NEW YORK :
THE RAILROAD GAZETTE, 73 BROADWAY.
1888.

the Fourteenth Annual Convention, held in Detroit in 1880
pages 11 to 20 of Report of that meeting),
The committee to whom was assigned the duty of preparing
Dictionary of Terms used in the Construction of Cars submitted
by of the book and reported that they had finished their
, and were discharged."

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18

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PREFACE TO THE FIRST EDITION.

Ever since the general interchange of cars among different railroads, a great deal of inconvenience, confusion, and delay, has been caused to those who build and repair them by the want of common names for the different parts of cars. One part is known by one name at one place and by quite different names at other places; and, what causes still worse confusion, a term often means one thing on one road and quite a different thing on another. A *Drawbar* is called a "Pull-iron" in one section, a "Shackle-bar" in another, and in some of the Middle and Southern states it is known by the euphonious name of a "Bull-nose." A *Journal-box* in one place means the brass-bearing which rests on, and is exposed to, the friction of the axle-journal; at other places, it means the cast-iron box which incloses the journal and its bearing and holds the lubricating material. Numberless examples of a similar kind might be given. The art of car-building, in fact, has grown more rapidly than the language relating to it. Early in the history of the Master Car-Builders' Association this subject attracted attention, and in 1871 a Committee was appointed to prepare a "Dictionary of Terms used in Car-building." This Committee originally consisted of eight or ten members, who held a number of meetings without accomplishing much, and it soon became apparent that it was too unwieldy to do the work which had been undertaken. It was finally narrowed down to those members of the Association whose names appear on the title page of this book, who were courageous enough to undertake the task of completing the work, probably, only because they were then quite ignorant of its magnitude.

The first plan was to give, as far as possible, the names of all the parts of cars and the synonyms in use in different parts of the country. This, it was soon found, would make the book much larger and the vocabulary more cumbersome than seemed desirable, and, at the same time, would rather add to than diminish the existing confusion. The Committee, therefore, determined to confine its labors chiefly

to selecting and assigning appropriate terms to those parts and objects which are in common use, and which pertain to railroad cars.

It should be noticed, too, that, to supply the want which demanded such a vocabulary, what might be called a double dictionary is needed. Thus, supposing that a car-builder in Chicago received an order for a *Journal-box*; by looking in an alphabetical list of words he could readily find that term and a description and definition of it. But suppose that he wanted, himself, to order such castings from the shop in Albany and did not know their name: it would be impracticable for him to commence at A and look through to Z, or until he found the proper term to designate that part. It was therefore necessary, in a dictionary of this kind, to provide the most copious illustrations and arrange them in some systematic way so that a person could find a representation of any part of a car he might have in mind, and from that illustration find the name. The manner in which this want has been met is fully described in the DIRECTIONS FOR USING THE DICTIONARY which follow the preface.

The system of cross-references employed in "Knight's Mechanical Dictionary" has also been adopted here. Thus, under the term *Axle* there are references to "*master car-builders' standard axle, muley axle, street-car axle*," etc. Under the word *Bar* a list of various kinds of bars, such as "*arch-bar, drawbar, guide-bar*," etc., is given. This will often aid very materially in finding terms.

Of the defects of the book, and its incompleteness, no one can be so well informed as the Committee who are its sponsors. Several years' time would be too little to devote to the compilation of such a dictionary, if completeness were aimed at; and if more care could have been given to the preparation of the material in the book, it could have been confined within considerably smaller limits, but at the same time more thorough investigation would have increased the vocabulary very much in other directions.

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to its usefulness, but rather an adva:

PREFACE TO THE REVISED EDITION.

The additions and modifications made in preparing the new edition of the Car-builders' Dictionary, have been as follows :

The number of engravings has been increased from 811 to 2,188. Allowing for a slight difference in style of numbering, there are, as nearly as may be, three times as many engravings in this edition as before. All drawings which appeared in the last edition appear also in this, but 156 of the 811 engravings have been made over new to obtain larger or better views.

To accommodate this great increase, as well as for greater neatness and convenience, the size of the page has been nearly doubled. This has the advantage of enabling different views of the same object or class of objects to be presented in nearly all cases on a single page, or on two pages facing each other.

An alphabetical classification and sub-classification of the engravings has been introduced in order to save the necessity of referring to an index to find a particular engraving or class of engravings. A double classification is necessary, since it is desirable to keep engravings of the same class together so far as possible. Therefore, nine-tenths of the engravings (excluding a few of a more or less miscellaneous character) are first grouped together under the six grand classifications: CARS, CAR-BODIES, CAR-BODY DETAILS, FURNISHINGS, TRUCKS, TRUCK DETAILS, and each of these are sub-classified alphabetically, as will be more fully seen in the Index preceding the engravings.

To further facilitate reference to the engravings, very numerous cross references have been added, so that cases of imperfect or doubtful classification, some of which were unavoidable, might cause as little inconvenience as possible. The numbers of the engravings on each page have also been added in the outer corner, with a running alphabetical headline. Lists of names of parts shown in each engraving have been generally repeated in immediate connection with each, to avoid the necessity of turning over many pages.

Certain obsolete or partially obsolete designs and devices are still retained, at the cost of some seemingly needless space perhaps, but at the request of members of the Executive Committee of the Association to the effect that all such matter should be retained for one edition after it had

ceased to be in general use as a standard for present construction.

It will be obvious that the additions made are not as well balanced as might be desired, to give each department and detail its due relative importance, nor are the drawings or types presented always the best or most perfect that might have been and would have been chosen had it been possible to procure drawings or to extend the revision for an unlimited time for that purpose. Certain defects of this kind which may be noted, as for instance in drawings of modern sleeping cars, may in general be safely ascribed to inability to obtain the necessary drawings after repeated efforts.

Since it has become clear from past experience that, even to a larger extent than was originally contemplated, the Dictionary is used and valued for the technical information contained in it, quite as much as for use as a mere dictionary of names, many notes have been added, and not a few engravings included which were not strictly essential to the Dictionary for its primary purpose alone. Especially in the furnishings, it has been aimed to illustrate each essentially different *type* of construction, including not only those which are actually distinguished from each other by different names, but such as might be, if it were desirable to carry out fully such minuteness of definition. The innumerable different forms of construction which differ only in style of ornamentation or dimensions, it has of course been neither possible nor desirable to include. In the main, the simplest and most characteristic form of each detail has been selected, neglecting the more elaborate and highly ornamented forms. In the numerous cases of drawings presented in the old edition, for which new designs have since been introduced, it was, for evident reasons, especially desirable to give both the new and old designs, since the new and old are now, in the main, both in use together. It has not seemed necessary in all such cases to add complete sets of reference numbers to both designs when one had them already.

The more important modifications in the first half of the volume, the dictionary part proper, have been as follows :

The reference-numbers to the engravings have be

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 was largely increased, advan-
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 mpler objects, represented by
 hich alone are often almost a

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 l essential feature of such a
 effectually attained by any
 viz., to make clear the dis-
 nected or alternative types
 nce, *Platform-roof*, *Platform-*
nd-plate Rod, *Brace Strain-*
and Body-counterbrace Rod;
iso-timber Carry-iron; *Berth-*
ord Splice and *Bell-cord Coup-*

To better serve this purpose,
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 paratively long one, giving
 exist between them. *Bell-*
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 eing disposed of by a refer-
 the primary definition. The

as existing. A few changes of th
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 a dictionary, nor even a possible
 language, nor to force the use o
 approximately settled usage to the
 most that can be done is to re
 where no approach to it exists, but
 settles, for example, upon the term
 instead of *Clear-story Window-sector*
 recognized, however much architect
 analogy may favor the latter term.
 be ascribed the short list of changes,
 which has become settled since the
 work was prepared.

All changes which have been m
 have been made only by the advice
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 it is needless to add, are more than
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 an entirely new field some changes
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 hoped, but hardly expected, that

DIRECTIONS

For Using the Car-builder's Dictionary.

To find the meaning of a given word or term, refer to it in the alphabetical list which constitutes the first half of the book, where a definition similar to those contained in ordinary dictionaries and a reference to some engraving illustrating the object—if it is capable of such illustration—will usually be found.

To find the name of a car or part of a car, examine the alphabetical list of the different classes of engravings in the index which immediately precedes them, until the class is found to which the object looked for belongs. If preferred, the main body of the dictionary may be consulted, index references to the different classes of engravings having been included therein in their due alphabetical order. By referring to the engravings included in that class, a representation of the object will usually be found. If the engraving is of a single object, its name will be found underneath; but if it consists of several or many parts, these will each be numbered and a list of the names of the parts, arranged consecutively by their numbers, will usually be found on the same page as the engraving, or the page opposite, and always at the beginning of the class to which the engraving belongs, or in the immediate vicinity. If the list is not on the same page, a running line over the engraving refers to the page on which it can be found.

Bearing in mind the system of alphabetical classification for the engravings, it will in general be as easy to turn at once to the engraving or class of engravings desired as to look out a word in the dictionary. This system is fully explained in the heading to the index to engravings, but it may be repeated here that the great bulk of the engravings are classified under the six general headings at the side, a sub-classification in due alphabetical order being made under each of them, and in general these sub-classes themselves are again sub-classified alphabetically, down to the individual engravings. A glance at the index will make the system clear.

Thus, suppose a reader wants the name of the longitudinal timbers under the floor of a freight car nearest the centre. These form part of a freight-car body. He therefore refers to "CAR-BODIES, FREIGHT" in the engravings, and finds that they are subdivided into *Box-cars*, *Cabooses-cars*, *Coal-cars*, *English "Wagon,"* *Fruit-cars*, etc., in any of which he can see the parts desired with a reference number referring to a list in the immediate vicinity.

If he wants the name of the piece of metal which rests on top of the journal of an axle and resists its wear, knowing it as a detail of a truck, he turns

**CARS,
CAR-BODIES,
CAR-BODY DETAILS,
FURNISHINGS,
TRUCKS,
TRUCK DETAILS.**

... and probably also to the
urnishings. Turning, there-
window," it is further sub-
ashes" and "for lower win-
red is found in figs 1659-61,
ce below it refers to fig. 1606,

except by a list under the en-
deemed to be sufficient, as such
likely to be named without know-
ure or detail they belonged to,
could be at once referred to.

• Index to Engravings immediately precedes the Engravings.

AN INDEX TO ADVERTISEMENTS

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Hoopes & Townsend, Philadelphia, Pa....

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Chester Steel Castings Co., Philadelphia, .

Wheels :

Frank H. Andrews, New York

Baltimore Car Wheel Co., Baltimore, Md..

Chester Steel Castings Co., Philadelphia, I

Harrisburg Car Mfg. Co., Harrisburg, Pa..

Michigan Car Co., Detroit, Mich.....

Peckham Car Wheel Co., New York

Thomas Prosser & Son, New York.....

Rochester Car Wheel Works, Rochester, N

A. Whitney & Sons, Philadelphia, Pa.....

Wheel Presses :

Richard Dudgeon, N. Y.....

Weed Preservation :

Fernoline Chemical Co., New York

A DICTIONARY OF TERMS USED IN CAR-BUILDING.

A

"A" car-roof. Figs. 189, 649. A car-roof with straight carlines, meeting at a point like rafters in the centre of the upper deck.

Acme spring. Figs. 2086-2086½, and 2088-9. A form of elliptic spring, the peculiarity in which consists in tapering a single leaf from the centre towards the ends, without the use of a number of separate leaves. The "improved" Acme elliptic spring, figs. 2088-9, is constructed of plates with a beveled edge, arranged one above the other as usual, and held in position by a wrought-iron band, as shown in fig. 2088. The advantages claimed for this form are that a less amount of steel is required (about 10 per cent.) for the same duty; that the liability to breakage is reduced, as the strains are confined more to the centre of the bar and less at the edges, and that friction and wear between the plates is reduced.

Acorn. Figs. 1269-78. A general term for the ornaments or tips used to finish the ends of rods of various forms.

Acorn butt-hinge. Fig. 789. A trade term for hinges having the hinge-pin ornamented with acorns at each end.

Adjustable foot-rest. Fig. 1194. A sliding foot-seat moving on rabbit-pieces. See *Foot-rest*.

Adjustable-globe lamp. Figs. 848 and 869. One with a globe chimney, which can be raised or lowered to suit the height of the globe.

Adjustable roller car-seat. Figs. 1140-41. See *Car-seat*.

Adjustable shade-holder. Fig. 867. See also figs. 987-989.

Adjusting-holes (crank of lever hand car.) 5, figs. 1724-6.

Adjusting-lever (Hartley chair). 15, figs. 1150-7. A lever by which the position of the adjustable foot-rests and back is regulated.

Adjusting-screw ("American" steam driver brake). 15, figs. 358-9. 25, figs. 968-5.

Adjusting-wedge (Cowell platform and coupler). 6, figs. 588. The cam shaped iron, moved by the compression-

AIR

lever (16), and compression-lever connecting-rod (7), by which the slide-pin (8) and rock-lever (2) are brought into appropriate adjustment.

Air-brake. Any brake operated by air pressure, but usually restricted to systems of continuous brakes operated by compressed air, in distinction from vacuum brakes, which see, which are operated by creating a vacuum. The air is compressed by some form of pump on the locomotive, and is conveyed by pipes and flexible hose between the cars, to cylinders and pistons under each car, by which the pressure is transmitted to the brake levers, and thence to the brake-shoes. The original air-brake is only used at the present time in connection with the *automatic brake*, and only on very heavy gradients, where the automatic alone is often inconvenient on account of the necessity of recharging the reservoirs. The use of the air-brake under these circumstances is now usually known as using "straight air." See *Westinghouse air-brake*. *Westinghouse automatic air-brake*. *Lough-ridge air-brake*. *Eames vacuum brake*. *Smith vacuum brake*.

Air-chamber (of student lamp). H, figs. 852-4.

Air-conductor (Bissell heater). Figs. 1858, 1868-4, 1400. Ordinarily called in other heaters, hot-air conductor or heat conductor.

Air-cylinder (Westinghouse brake). See 5, figs. 298-4, 298-9. A hollow cast-iron cylinder with a piston, which compresses the air required to operate the brakes. The piston in the air-cylinder is directly connected with and is worked by the piston in the *steam-cylinder*.

Air-cylinder head (Westinghouse brake). 6, figs. 298-4, 298-9. The cover for the lower end of the air-cylinder of an air-pump for a Westinghouse Brake. See *Cylinder-head*.

Air-flue (refrigerator cars). Fig. 181. The vertical passage at each end of the car through which the chilled air passes down to enter the refrigerator. At the sides are the *condensing-diaphragms D*.

Air-gauge (Westinghouse brake). See 14, fig. 811. A

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. A general
-pipe.

-1304.

U, figs. 130-

H, figs. 130-

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304-6,

20, fig. 1397.

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aped mouth-

Alcove-pan or bottom. 2, figs. 1594-44. See *Water alcove-pan* or *Bottom*.

Alexander slip-burner. Fig. 883. See *Slip-burner*.

Allen paper-wheel. Figs. 2159-61. A car-wheel with a tire and centre formed of compressed paper held between two plate-iron face-plates. It is in wide and increasing use for passenger service. See *Steel-tired wheel*.

Allen truck (for passenger cars). Fig. 1959. An exceptional form of truck, little used, in the nature of a diamond truck, but having a journal spring. The same type is quite extensively used on freight cars, though passing out of use, and a modification of the standard journal-box was necessary for it. See fig. 1959.

Alley-way. Fig. 214. More properly a *corridor*. A narrow passage at the side of staterooms or compartments in parlor or sleeping cars. In Mann boudoir cars it runs the entire length of the car.

American Brake Company's steam brake-gear. Figs. 358-369. See also *Compression-brake*. *Steam driver-brake*. *Steam tender-brake*.

American refrigerator car. One of the class of cars having the ice-boxes at both ends of the car supplied from the roof. The drip-water passes off through four troughs, being utilized for cooling as it passes away.

Anti-clinker car-heater. Figs. 1486-1523. See *Spear anti-clinker car-heater*.

Anti-clinker grata. 18, fig. 1490. A stove-grate placed below the fire-pot so as to leave an annular opening between the two through which the clinkers can be raked out from the fire.

Anti-friction car-door hanger. Figs. 791-801. See *Car-door hanger*.

Anvil (of track torpedoes). Fig. 1890. Interior pieces of iron placed directly over the fulminating powder to insure its ignition. The best track torpedoes have three anvils.

Apron. See *Door-apron*. *Roof-apron*.

Arbor. "A spindle or axle for a wheel or pinion; a mandrel on which a ring or wheel is turned in a lathe." —*Knight*. See *Door-latch arbor*.

Arch. See *Truss-arch*.

Arch (of an elliptic spring). Figs. 2081-83. The height from the centre of the scrolls at the ends of the ellipse to the under side of the main leaf of the spring. Twice the arch of an elliptic spring, less the thickness of the spring-bands, is the set and is the maximum amount which an elliptic spring can be compressed. In a half-elliptic spring, fig. 2081, the arch and set differ only in the thickness of the spring-band.

Arch-bar. Fig. 2027. 14, figs. 1907-82. A bent wrought-iron bar which forms the top member of an iron truck side-frame. The next lower member is the inverted arch-bar, and the next lower (occasionally used) is the auxiliary arch-bar, which is sometimes made continuous, as in fig. 1915-20. The pedestal tie-bar comes under all, and sometimes becomes an arch-bar. It is so called in fig. 1788. See also *Centre-bearing arch-bar* and *Centre-bearing inverted arch-bar*, for 6-wheel trucks.

Arched roof. Figs. 50, 85, 86. A roof, the surface of which is curved. The Mann boudoir cars are built with arched roofs, but they are otherwise at the present time little used for passenger cars. The arching of freight roofs is very slight, such as can be produced by trimming a straight carline.

Archer automatic freight-car coupler. Figs. 412-144. One of those recommended for further trial by the M. C. B. Association. It retains a loose link. See *Automatic freight-car coupler*.

Arch-rail (English). See *End arch-rail*.

Argand burners. Figs. 872-3. See *Lamp-burners* and below.

Argand-lamp. A lamp invented by Argand, a native of Geneva, about the year 1784. It consists of two concentric cylindrical tubes in which is the annular wick used in this peculiar burner. The tube inclosing the wick is closed at the bottom and communicates by a pipe with the oil reservoir. The interior tube being open, free access of air is allowed to the interior and exterior of the flame, insuring more perfect and equal combustion. In 1880 a French mechanic named Carcel patented an improvement by which the oil is pumped from the reservoir to the wick by the power derived from a spring or by the ascending column of air above the chimney. This is called the *Mechanical lamp*, but is little used except in large lamps for light-houses, etc.

Argand-lamp (Muehring). Figs. 849-50, 873. Patented May 18, 1875. It has certain improvements in the way of convenience for filling and for the use of a long wick, as will be more clearly seen in the engraving.

Arm. See	<i>Herth-arm.</i>	<i>Seat-back arm.</i>
	<i>Lamp-arm.</i>	<i>Striker arm.</i>
	<i>Seat-arm.</i>	<i>Tur-arm.</i>

Arm-cap. 16, figs. 1189 and 1197-8. A metal plate, wooden-cap, or piece of upholstery, with which the top of a seat-end, arm-rest or chair-arm is covered. Those for chair-arms, however, are also called *chair-arm plates*, which see. An *arm-rest*, which see, is fixed to the side of the car.

Arm-holder (English). 200, fig. 205. See *Arm sling*.

Armored brake-hose. Brake-hose covered with a woven wire fabric, to protect it from injury or abrasion. Another form of armored brake-hose is formed by winding a continuous wire spirally around it by a machine which makes the spiral slightly smaller than the tube, so that it grips it tightly. *Vacuum brake-hose*, for the *Kaiser* and other vacuum brakes, is usually lined with coiled wire on the inside to prevent collapsing, but such is not termed armored brake-hose.

Arm-pivot. See *Seat-arm pivot*.

Arm-plate. See *Seat-arm plate*.

Arm-rest. 26, figs. 675-61. 26, figs. 664-5. A wooden or metal bar or ledge attached to the side of a car, and not, like an arm-cap, to the top of a seat-end, for passengers to rest their arms on.

'5, figs. 205, 207. Nearest *iron or hand-rail*. The end ght-iron bar secured at the serving as a hand-rail for *roof ascending-rail*, or *roof* 205 and 207, is a similar of of a covered vehicle.

4, figs. 205 and 207. Near-*adder-round*. A roughed the ends of a covered ve- and to the roof. They are enger and freight cars. In

fig. 1484-5. A trap under ashes through the floor

e lower portion of every hich the ashes fall. Under-*box*, as in fig. 1850, or an ash-pit is made up of a *pit base* and closed by an more commonly two, *ash-* inguished as right and left; the stove. The ash pit in fig. 1472 on an *ash-pit* nt or *frame*. Below are y such parts.

the inner circumference of the tire 1 *pits* sunk into it and the circumferen centre has *lugs* running across the co packing is compressed by a steam-ham rugations and pits and against the lugs not only to make the wheel elastic and dispense with the use of bolts in connec wheel-centre. The packing is protecte a *packing-flange* cast on the wheel-ce other by a wrought-iron *cover-plate* shi tailed seat in the wheel-centre after the A dove-tailed lip or ring is cast on which enters into a corresponding groc tire, connecting the two in such a wa breakage to prevent the broken piece This lip, however, is not relied on to ho except in case of breakage.

Automatic air-brake. One which is auton by breakage of a coupling, derailment, e indefinite, but usually refers to the *We-* matic *air-brake*, figs. 298-335, which se only one in general use in this country. *pression-brake*, figs. 368-9.

Automatic closet-ventilator. Figs. 101 *exhaust hopper-ventilator*.

Automatic drip-valve (American steam d figs. 858-9, 863-5; 13, figs. 863-5. A valve cylinder to receive and eject the water c

the following were named as of sufficient *prima facie* merit for experimental tests:

Ames, figs. 409-11.	Gifford, figs. 416-7, 515-6.
Archer, figs. 412-14.	Janney, figs. 420-8.
Conway (not shown).	Mitchell, fig. 415.
Cowell, figs. 419-19.	"United States," fig. 418.
Wilson-Walker (not shown).	

Of these the Cowell and Janney couplers couple "in a vertical plane," so called, i. e., the movement of their parts in coupling take place in a horizontal plane, and bear a close general resemblance to the Cowell, Janney and Miller passenger couplers. The others bear a general resemblance to the old established link-and-pin freight-car coupling. Of these latter the Ames, Mitchell and Wilson-Walker use neither a loose link nor a loose pin, the place of the latter being taken by a hook connected to the tongue-shaped part, which takes the place of the old link. The others use a loose link of the usual form, but have no loose pin.

At the convention referred to a resolution was passed that the vertical plane principle best fulfilled the mechanical conditions of a perfect coupler, to which class belong the Cowell and Janney couplers. Another resolution advised those roads that did not care to experiment with that type of coupler, fulfilling this mechanically perfect principle, to experiment with the other couplers named above.

Automatic lubricator (steam-pump of Westinghouse brake). 15, fig. 811.

Automatic ventilator. Figs. 1557, 1568-9. A ventilator which is self-adjusting, so as to exhaust air from a car if the train runs in either direction. A great variety of such devices exists, not all shown. See *Ventilator*. *Bell's exhaust hopper-ventilator*.

Automatic window-catch. Figs. 1663-4, etc. A number of other devices, which, in effect, answer to this name, are shown in the illustrations. See *Sash-lock*.

Auxiliary arch-bar. 16, figs. 1912-30. A wrought-iron bar sometimes used, which forms the lower member of diamond-truck side-frame. In some cases such arch-bars are made *continuous* by transverse pieces which extend across from one frame to the other under the transoms, as in the figs. referred to. See *Arch-bar*.

Auxiliary brake-valve (Westinghouse brake). Fig. 850; 33, fig. 811. A valve for use with the automatic brake on extra heavy gradients in either passenger or freight service, in order to provide a second means of admitting and regulating the pressure of air the engine and tender brake-cylinders. When the graduating-handle 3 is

turned, it compresses the spring until it forces the valve from its seat, which permits the air to flow into the driving-wheel brake and tender cylinders until the pressure in these cylinders is sufficient to force the spring 10 up by acting on the piston 11, when the valve again seats, preventing any further admission of air to the cylinders. Hence, the pressure admitted to the cylinders depends upon the extent to which the spring 10 is compressed by the graduating-handle. To release the brakes the graduating-handle is turned in an opposite direction, permitting the air to escape through holes in the upper part of the case. This valve is now little used, the *pressure-retaining valve*, which see, fig. 817, serving as a substitute.

Auxiliary buffer-spring. 6, figs. 388-9. A spring placed back of a draw-spring to give greater resistance to compression on the drawbar in buffing. In this manner two springs operate in buffing, and only one in tension.

Auxiliary discharge-valve (Westinghouse brake). 56, figs. 811, 851. A valve intended for use with extra long freight trains, to enable the brakes to be applied, when desired, to a part only of the train. It is not in general use, and is intended only for exceptional use.

Auxiliary draft-spring (Janney coupler). 27, figs. 542-554, 555-601. A spring of low capacity and limited motion, placed back of the rear follower to compensate for absence of slack.

Auxiliary drawbar follower-plates. 15, figs. 388-9. Iron plates which bear against the ends of an *auxiliary buffer-spring*. One plate of this kind bears against each end. The pressure on the drawbar is thus transmitted to the auxiliary spring.

Auxiliary draw-spring (English). 52, figs. 205 and 206. An India rubber spring on the drawbar which assists in taking the draft strain. Seldom used.

Auxiliary release-valve (Westinghouse double-check triple-valve). 18, figs. 355-7.

Auxiliary reservoir (Westinghouse automatic air-brake). 1, figs. 825-6, 893, 801-2. A cylindrical reservoir made of thin boiler iron, attached to the under side of a car or tender by *auxiliary-reservoir bands* attached through *auxiliary-reservoir beams*. In freight cars, auxiliary reservoir beams are termed *brake-cylinder blocks* and *end-blocks*, figs. 844-5. The reservoir serves to hold a supply of compressed air to operate the brakes of each car, and

at pipe by which the triple auxiliary reservoir.

pring (English). 87, fig. posed between the adjust-
ron. Not in general use.

74-5, etc. A shaft made of h a pair of wheels are at-
shed according to use as *hand-car*, *street-car axle*,
manufacture as *hammered*,
etc., which see. See also

In nearly all cases the
ied to the axle, but it has
or both of them, so that it
ie axle. Experience, how-
hese attempts and indicated
the loss greater than has
standard axle is shown in
the names of the parts
f axle; 2, *Neck of axle*;
d bearing; 5, *Collar*; 6,
-axle.

rnal-box, which see. See

figs. 116-119 and 204 A
e axle-box through which
On English oil axle-boxes
o the box, with a strip of

which permits vertical motion of th
strains movement in any other direc

Axle-guard crown (English). 17,
main part of the *axle-guard*, which
Axle-guard crown washer (English
119. A piece of wrought-iron plate
for three or more bolts, which secu
the *axle-guard* to the *solebar*.

Axle-guard keep, or *horn-stay* (Eng
119 and 204-207. A piece of iron
lower end of the jaws of the *axle-gu*

Axle-guard stay-rod, or *axle-guard s*
15, fig. 205. American equivalent,
longitudinal rod connecting the lowe
guards, and keeping them at the right

Axle-guard wing (English). 18, figs. 11
part of an *axle-guard*, strengthening
Axle-guard wing-washer (English).

A piece of plate used as a washer for
securing the wing of the *axle-gua*
See *Axle-guard wing*.

Axle-packing. A *dust-guard*, which
packing is often called *axle-packing*.

Axle safety-bearing (passenger car t
1958, 1960, etc. A bar of iron like a
bolted to the safety-beam of a truck a
axle safety-strap, 55, goes below it,
gether forming a circle around the

Axle-seat. The hole in a car-wheel which receives the axle. More properly, it is the inside surface of this hole which comes in contact with the axle, and not the hole itself. The corresponding part of an axle is called the *wheel-seat* or *wheel-fit*.

Ayer rubber refrigerator car. Figs. 138-9. A car, the especial peculiarity of which is the use of sheets of rubber instead of paper as a non-conducting material. The ice is put on a rack through doors opening outside in each end of the car. See *Refrigerator car*.

B

Babbitt-metal. "An alloy, consisting of 9 parts of tin and 1 of copper, used for journal-boxes; so called from its inventor, Isaac Babbitt, of Boston (patent, 1839). Some variations have been made, and among the published recipes are:

Copper.....	1	1
Regulus of antimony.....	1	5
Tin.....	10	10

Another recipe substitutes zinc for antimony.

The term is commonly applied to any white alloy for bearings, as distinguished from the box-metal or brasses in which copper predominates."—*Knight*.

Babbitt-metal bearing. Fig. 1905. A style of bearing of which a great variety of forms exist, which in effect substitute babbitt-metal in some of its many forms for brass as a bearing surface. *Lead-lined bearings*, which see, are different in that they merely use a thin sheet of lead over the brass, to correct slight irregularities and give an even bearing-surface.

Babcock fire-extinguisher. Fig. 1044. A device for causing the rapid generation of carbonic-acid gas when desired, by breaking a bottle of acid in the interior by means of the *bottle-breaking head* (the handle projecting up in the centre of the top of the apparatus). The solution within consists of about 2½ lbs. of bicarbonate of soda in about 6 gallons of water.

Back. See *Seat-back*. *Blat seat-back*.

Back (for a pipe-clip). Fig. 1345. A metal strap sometimes used to attach the clips to, instead of attaching the latter directly to the surface to which the clip is attached.

Back-arm. See *Seat-arm*.

Back base-plate (Spear heater). Fig. 1501. See *Base-plate*.

Back cylinder-head (Westinghouse and other brakes). 4, figs. 229-31. The cover for the end of a brake cylinder

which has an opening in the centre for the piston rod. For convenience of designation the end of the cylinder opposite to the piston rod is always called the *front* end and that adjoining the piston rod the *back* end, as in locomotives.

Back cylinder-head (Westinghouse tender brake). Fig. 307; 4, fig. 330.

Back division-strips (Spear heater). Fig. 1530.

Back face-plate (steel-tired wheels). Figs. 2159-71. The inner one of the two plates connecting the tire with the hub. See *Front face-plate*.

Back foot-rest (Hartley chair). Fig. 1157. See *Foot-rest*.

Back hot-air pipe (Gouge heater). 10, figs. 1405-7.

Back of case (Gouge heater). 81, fig. 1409.

Back-offset (Gouge heater). 86, fig. 1409.

Back running-pipe (Gouge heater). Fig. 1471. See *Running-pipe*.

Back seat-bottom rail (longitudinal seat). 36, fig. 1844.

A horizontal wooden strip at the back edge, to which a wooden seat-bottom is attached. See also *Front seat-bottom rail*.

Back seat-rail (street car seats). 30, fig. 1844. A longitudinal strip of wood which extends along the back edge and is fastened to the window posts.

Back seat-rail (English). 152, figs. 305, 306. In a carriage a small transverse wooden bar secured to the partition and supporting the seat-boards.

Back smoke-collar (Gouge heater). 32, figs. 1412-4.

Back squab (English). 197, figs. 304, 305, 306. American equivalent, *seat-back*. In a carriage, that part of the seat which fits the small of the passenger's back, and also supports the head and a fixed back, covered with broadcloth, and stuffed with curled horse-hair, and also made elastic by springs (which see).

Back squab sofa springs (English). 302, fig. 305. Analogous to the American back-springs. One end of these springs butts against the partition, and the other against a sheet of stout canvas, the back squab resting against the latter.

Baggage-barrow. Figs. 1900-1, etc. See *Barrow-truck*. *Baggage "wagon-truck"*.

Baggage-car. Figs. 51, 52, 53, 54, 55. A car for carrying the baggage of passengers. A combination baggage-car, fig. 55, is one having compartments set off for express or mail, or both. A combination car or coach, fig.

intern or other utensil. As
-986; to *swing-barrel truck*,

Fig. 2014. The latter is a yoke
a journal-box, which passes
to sustain the end-thrust of

1-48. A stove invented and
ter for warming cars. It is
in a coil of pipe in the inside
circulate through a series of
the car. A new form of sur-
love upon the outside, as in
erating upon much the same
is recently been introduced,
e Standard Car Heating &
as is now (1884) undergoing
ntly impossible to present
the Baker car-heater is now
th & Co.

ker heater).

1. Fig. 1480. Controls the

ican equivalent, *gravel car*.
fitted with falling doors at
for conveying ballast, rails

uard-band.

tion-bar.
Bolt drawbar.
Buffer-bar.
Drawbar.
Draw-timber tie-bar.
Equalizing-bar.
Grate-bar.
Guide-bar.
Pedestal tie-bar.

arch-
Compre
Cross-b
Rocking
Shackle
Side bea
Tension
Tie-bar
Trancon
Truck-b

Bar-lift. See *Bar sash-lift*.

Barnard door-holder. Figs. 776-8.

liarity of which is the steel wire *spr*
a floor-stop of adjustable height, in
knob attached to the door engages.

Barrel door-bolt. Fig. 760. A door-b
metal bar and held on its slide in a r
rel." It is constructed so that when
or disengaged from its keeper, it c
short lever or knob, and held in eith
able stops.

Barrow-truck. Figs. 1900-1906. This
to designate two-wheeled vehicles u
for moving freight and baggage by h
usual-practice is to speak of baggage b
trucks, which see, although both are
nated as *barrow-trucks*.

Bar sash-lift. Figs. 1668-72; 21, fig. 6
lift having a short horizontal metal b
flanged studs or stanchions; used for
sleeping and drawing room cars.

Base (Gouge heater). Fig. 1481.

Base (of ash-pit, Spear heater). Fig. 1499.

Base-band (Gouge heater). Figs. 1433-1433. A cast-iron band fastened to the floor to protect the bottom, front and end of case.

Base-burner. A furnace or stove in which the fuel is contained in a hopper termed the *magazine*, so that it is fed by gravity to the fire as the lower stratum burns away. The supply is thus continuous. The device is in principle very ancient, but it has only in recent years come into wide general use. Fig. 1473 is a base-burner, and also some other forms of heaters not shown.

Base-plate (of a derrick or crane). D, figs. 151-3. A large plate placed on the floor of the car for supporting the mast. Another method is by a *mast-pocket*, which see, underneath the car. 20, figs. 77-78.

Base-plate (Spear heater). 21, figs. 1496-90, 1510-13. See also *Back base-plate*, fig. 1501. A cast-iron cylindrical ring, which forms the bottom part of the heater. It has openings for cold and hot air and carries the ash-pit doors.

Base-plate screen (Spear heater). Fig. 1506. A grating for covering the air opening of a base-plate.

Base-top (Johnson heater). 22, fig. 1472.

Base-washer (passenger-car platform posts). 40, figs. 155-185, and 109, figs. 1843-6. A metal ring or plate, which forms a bearing for the post on the platform end-timber.

Basin. 5, fig. 1600; 2, fig. 1570. A hollow vessel made of porcelain or metal, and in cars usually fixed in a suitable stand with pipes and other attachments for filling it with water and emptying it. Such basins are used as lavatories in sleeping and other passenger cars. They are emptied at the bottom through a pipe connected to the basin by a *basin-coupling*, which is closed by a *basin-plug*. The basin-plug is attached to a *basin-chain*, which again is fastened to a stanchion called the *basin-chain holder*.

Basin-chain. 4, fig. 1572. See *Basin*.

Basin-chain holder. 3, fig. 1572. See *Basin*.

Basin-couplings. Figs. 1572 and 1580. See *Basin*.

Basin-plug. 5, fig. 1573. See *Basin*.

Basin-pump. Figs. 1570-1. A pump of peculiar construction for supplying the basin of sleeping and parlor cars from the *tank* carried under the slab. It is called *single* or *double-acting*, according as the upward stroke only,

or both the upward and downward strokes eject water. Double-acting are most used. For names of parts, which explain themselves, see illustrations.

Basket-rack (English, parcel-net). Figs. 696-701; 145, figs. 155, 158, etc. A receptacle made of metal rods, or a combination of rods and wire netting for holding parcels attached to the sides of passenger cars above the heads of the passengers, so as to be out of the way. A basket-rack of extra length for the Mann boudoir cars, with exhaust ventilators at each end, is shown at 7, figs. 690-1, and one of quite exceptional form in the frontispiece. Parlor cars usually have no basket-rack, but sometimes a *package-rack* (fig. 699) is placed between the windows, within convenient reach of the passengers while sitting in their seats.

Basket-rack bracket. 1, figs. 696-7 and 701. A light metal or wooden support for the end or centre of a basket-rack.

Basket-rack netting. 2, figs. 696-7 and 701. Wire netting with very large meshes, which forms part of a basket-rack for holding small articles.

Basket-rack rod. 3, figs. 696-7 and 701. A small round metal bar which forms the main portion of a basket-rack, and to which the netting, when used, is fastened. Modern basket-racks rarely use netting.

Basket-rack tip. 4, figs. 696-7 and 701. An ornamental knob or acorn on the end of a basket-rack rod.

Bastard Howe (freight-car framing). Figs. 5-7. A style of framing having the vertical rods and inclined posts like the familiar Howe truss, but having also an upright post connected with the rod and serving more or less as a part of the truss. The Howe truss proper has yet never been used in freight-car construction, but the adoption of it is now under consideration on the Pennsylvania Railroad.

Bastard Pratt framing is a similar modification of the Pratt bridge-truss, which differs from the Howe in having vertical posts instead of rods, and inclined rods instead of braces. The regular Pratt truss is much used, however, and the bastard Pratt rarely.

Batten. "A piece of board or scantling of a few inches in breadth."—*Webster*.

Batten wagon (English). A four-wheeled flat car about 24 feet long, fitted to carry sawed timber about 23 feet long, termed *battens*.

improve the line of vision of

ing of semi-circular section.
frame which form a guide
e known as the *inside bead*,
d."—*Knight*.

ce of the *inside bead* is taken
ide window-stop; the place
outside window-stop, and of
parting-strip, or *stop-bead*.
also frequently applied to
lding of simple outline, as
ing and *Stop-bead*.
e *Bead* and *Planted mould-*

erally applied to any piece
antling, whether subject to
or example, 'collar-beam,'
n,' the two former being
of compression and ten-
ter to transverse strain."—

r, large in proportion to its
for use"—*Webster*.
proportions is also called a

points and loaded in a
ue to its length is called

is in contact with it. Thus a block
the end of a timber rests is called a *b*
block or bushing in contact with a
bearing.

For M. C. B. standard *journal-bearing*

See <i>Axle safety-bearing</i> .	<i>Rocker-be</i>
<i>Body Truss-rod bearing</i> .	<i>Rocker sic</i>
<i>Brake-hanger bearing</i> .	<i>Safety-bec</i>
<i>Brake-shaft bearing</i> .	<i>ing.</i>
<i>Centre-bearing</i> .	<i>Side-beari</i>
<i>Crank-shaft bearing</i> .	<i>Spring-pl</i>
<i>Cup side-bearing</i> .	<i>Stop jour</i>
<i>Dust-guard bearing</i> .	<i>Stop-key j</i>
<i>Half-elliptic-spring bearing</i> .	<i>Swing-han</i>
<i>Hopkins' journal-bearing</i> .	<i>Truck-bols</i>
<i>Journal-bearing</i> .	<i>ing.</i>
<i>Lead-lined journal bearing</i> .	<i>Truck side</i>
<i>Lever-shaft bearing</i> .	<i>Truss-rod</i>
<i>Lower brake-shaft bearing</i> .	<i>Upper bra</i>

Bearing-block (Ross flange brake-shoe).

Bearing-spring (logging cars). Fig. 18
but not the common term for the
main-springs of the car.

Bearing-spring (English). 22, figs. 11
American equivalent, *bolster-spring*
which carries the weight of the vehicle
axle-box. In English practice almost
elliptic spring.

Bearing-spring buckle (English). 23
204-207. American equivalent, *spring*
wrought-iron strap which connects

"Bee" door-spring. Fig. 756. See *Door-spring*.

Bell. See *Recording-bell*. *Signal-bell*. *Smoke-bell*.

Bell-cord. Fig. 709. A rope, one end of which is attached to a signal-bell on the engine, and which extends along the tops of the cars the whole length of the train, and is used for signaling to the locomotive runner. It is carried by various forms of *bell-cord bushings*, *bell-cord hangers* and *bell-cord guides* (which see). On freight trains, when used at all, which is the exception, it is placed on the outside, and on top of the roofs of the cars, but in passenger trains it is attached to the rafters or purlins by suitable supports, on the inside of the cars. On passenger trains, the *bell-cord* is made of lengths equal to that of each car, and is fastened together with suitable *couplings*. Bell-cord is made of flax, hemp and sometimes of leather, and is known by the following names in trade: *Brass-wire covered*; *fancy braided*; *flaxen*; *Italian hemp*; *solid leather*; *solid braided*. The usual sizes are $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in. diameter.

The bell-cord was first used by William Hambright, a locomotive engineer, in 1833, on the old horse-power railroad between Lancaster, Pa., and Philadelphia. Hambright affixed a common bell to the interior of the engine cab, and ran a rope backward through the interior of the car. The rope, in its present form, was devised by Capt. E. A. Ayres, of the Erie Railway. The English term for a cord to answer the same purpose in a different way, is *communication-cord*, which see.

Bell-cord beveled-bushing. Figs. 706-8, 719, 738-9. See *Bell-cord bushing*.

Bell-cord bushing. Figs. 702-708 and 719, 738-9. A thimble lining a hole through a partition for a bell-cord to pass through; in distinction from a *bell-cord guide*, which is attached to the side or roof of the car or to a bell-cord hanger and serves solely the purpose which its name implies. Some confusion, however, exists in the use of these terms, as for instance, fig. 719, which is really a *bell-cord guide*, but commonly called a *bell-cord bushing*. For passing the bell-cord through inclined surfaces *beveled-bushings* are used, which are frequently provided with one or more *pulleys* to avoid friction.

Bell-cord coupling. Figs. 710-714. The hook attached to the end of a bell-cord to enable it to be connected or disconnected at pleasure with another bell-cord; not to be

confused with a *bell-cord splice*, figs. 743-745, which is intended as a permanent connection.

Bell-cord double strap-hanger. Fig. 737. See *Bell-cord hanger*.

Bell-cord end-hook. Fig. 715. A metal hook with a screw-shank by which it is attached to the end of a car. The hook is used to fasten the end of a bell-cord to the last car and thus hold it in its place, and prevent it from being drawn out of its guides.

Bell-cord fixed hanger. Figs. 732-3 and 742. See *Bell-cord hanger*.

Bell-cord guide. Figs. 702-42. A metal eye or ring attached to the roof or ceiling of a car, or to the end of a *bell-cord hanger* (which see), and by which a bell-cord is carried or conducted. According to their method of attachment to the car they are designated as bell-cord guides *with flange*, or *with screw*, or *with screw and flange*, and they are often provided with one or more pulleys, sometimes as many as four, as in fig. 727, when the bell-cord is to be conducted in an oblique line. The pulleys are ordinarily at the bottom, but sometimes at the side of the bell-cord guide, according to the direction of probable strain. Certain tube-like forms of bell-cord guides are occasionally miscalled *bell-cord bushings*, which see.

Bell-cord-guide washer. Fig. 729. An ornamental washer for making a finish for a bell-cord guide where it is attached to a car roof.

Bell-cord hanger. Figs. 732-45. A guide for the bell-cord, hanging usually from the centre of the clear-story or upper deck. In its original form it consists of a *bell-cord strap* 2, attached to a *bell-cord strap-hanger bracket* 3, which latter is screwed to the top of the car. The simpler forms of these brackets, as fig. 735, are called *screw-tops*. The lower end of the strap carries a ring called the *bell-cord guide* 4, which latter is often provided with a pulley at the bottom to obviate friction. To avoid unpleasant vibration, the *double strap-hanger* is used, giving greater lateral stability, and recently *bell-cord rod-hangers*, fig. 735, have been introduced, permitting no lateral motion whatever, but swinging longitudinally on a pivot. *Bell-cord fixed hangers*, figs. 732-3, etc., are chiefly used where the drop is small, although the tendency to use them in all cases is increasing.

for permanently spacing
 1. See *Bell-cord coupling*.
 12. See *Bell-cord hanger*.
 13. 734-741. See *Bell-cord*
 14. 742-749. See *Bell-cord*
 15. 750-757. See *Bell-cord*
 16. 758-765. See *Bell-cord*
 17. 766-773. See *Bell-cord*
 18. 774-781. See *Bell-cord*
 19. 782-789. See *Bell-cord*
 20. 790-797. See *Bell-cord*
 21. 798-805. See *Bell-cord*
 22. 806-813. See *Bell-cord*
 23. 814-821. See *Bell-cord*
 24. 822-829. See *Bell-cord*
 25. 830-837. See *Bell-cord*
 26. 838-845. See *Bell-cord*
 27. 846-853. See *Bell-cord*
 28. 854-861. See *Bell-cord*
 29. 862-869. See *Bell-cord*
 30. 870-877. See *Bell-cord*
 31. 878-885. See *Bell-cord*
 32. 886-893. See *Bell-cord*
 33. 894-901. See *Bell-cord*
 34. 902-909. See *Bell-cord*
 35. 910-917. See *Bell-cord*
 36. 918-925. See *Bell-cord*
 37. 926-933. See *Bell-cord*
 38. 934-941. See *Bell-cord*
 39. 942-949. See *Bell-cord*
 40. 950-957. See *Bell-cord*
 41. 958-965. See *Bell-cord*
 42. 966-973. See *Bell-cord*
 43. 974-981. See *Bell-cord*
 44. 982-989. See *Bell-cord*
 45. 990-997. See *Bell-cord*
 46. 998-1005. See *Bell-cord*
 47. 1006-1013. See *Bell-cord*
 48. 1014-1021. See *Bell-cord*
 49. 1022-1029. See *Bell-cord*
 50. 1030-1037. See *Bell-cord*
 51. 1038-1045. See *Bell-cord*
 52. 1046-1053. See *Bell-cord*
 53. 1054-1061. See *Bell-cord*
 54. 1062-1069. See *Bell-cord*
 55. 1070-1077. See *Bell-cord*
 56. 1078-1085. See *Bell-cord*
 57. 1086-1093. See *Bell-cord*
 58. 1094-1101. See *Bell-cord*
 59. 1102-1109. See *Bell-cord*
 60. 1110-1117. See *Bell-cord*
 61. 1118-1125. See *Bell-cord*
 62. 1126-1133. See *Bell-cord*
 63. 1134-1141. See *Bell-cord*
 64. 1142-1149. See *Bell-cord*
 65. 1150-1157. See *Bell-cord*
 66. 1158-1165. See *Bell-cord*
 67. 1166-1173. See *Bell-cord*
 68. 1174-1181. See *Bell-cord*
 69. 1182-1189. See *Bell-cord*
 70. 1190-1197. See *Bell-cord*
 71. 1198-1205. See *Bell-cord*
 72. 1206-1213. See *Bell-cord*
 73. 1214-1221. See *Bell-cord*
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 78. 1254-1261. See *Bell-cord*
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 82. 1286-1293. See *Bell-cord*
 83. 1294-1301. See *Bell-cord*
 84. 1302-1309. See *Bell-cord*
 85. 1310-1317. See *Bell-cord*
 86. 1318-1325. See *Bell-cord*
 87. 1326-1333. See *Bell-cord*
 88. 1334-1341. See *Bell-cord*
 89. 1342-1349. See *Bell-cord*
 90. 1350-1357. See *Bell-cord*
 91. 1358-1365. See *Bell-cord*
 92. 1366-1373. See *Bell-cord*
 93. 1374-1381. See *Bell-cord*
 94. 1382-1389. See *Bell-cord*
 95. 1390-1397. See *Bell-cord*
 96. 1398-1405. See *Bell-cord*
 97. 1406-1413. See *Bell-cord*
 98. 1414-1421. See *Bell-cord*
 99. 1422-1429. See *Bell-cord*
 100. 1430-1437. See *Bell-cord*
 101. 1438-1445. See *Bell-cord*
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 105. 1470-1477. See *Bell-cord*
 106. 1478-1485. See *Bell-cord*
 107. 1486-1493. See *Bell-cord*
 108. 1494-1501. See *Bell-cord*
 109. 1502-1509. See *Bell-cord*
 110. 1510-1517. See *Bell-cord*
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 120. 1590-1597. See *Bell-cord*
 121. 1598-1605. See *Bell-cord*
 122. 1606-1613. See *Bell-cord*
 123. 1614-1621. See *Bell-cord*
 124. 1622-1629. See *Bell-cord*
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 126. 1638-1645. See *Bell-cord*
 127. 1646-1653. See *Bell-cord*
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 132. 1686-1693. See *Bell-cord*
 133. 1694-1701. See *Bell-cord*
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 146. 1798-1805. See *Bell-cord*
 147. 1806-1813. See *Bell-cord*
 148. 1814-1821. See *Bell-cord*
 149. 1822-1829. See *Bell-cord*
 150. 1830-1837. See *Bell-cord*
 151. 1838-1845. See *Bell-cord*
 152. 1846-1853. See *Bell-cord*
 153. 1854-1861. See *Bell-cord*
 154. 1862-1869. See *Bell-cord*
 155. 1870-1877. See *Bell-cord*
 156. 1878-1885. See *Bell-cord*
 157. 1886-1893. See *Bell-cord*
 158. 1894-1901. See *Bell-cord*
 159. 1902-1909. See *Bell-cord*
 160. 1910-1917. See *Bell-cord*
 161. 1918-1925. See *Bell-cord*
 162. 1926-1933. See *Bell-cord*
 163. 1934-1941. See *Bell-cord*
 164. 1942-1949. See *Bell-cord*
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 166. 1958-1965. See *Bell-cord*
 167. 1966-1973. See *Bell-cord*
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 169. 1982-1989. See *Bell-cord*
 170. 1990-1997. See *Bell-cord*
 171. 1998-2005. See *Bell-cord*
 172. 2006-2013. See *Bell-cord*
 173. 2014-2021. See *Bell-cord*
 174. 2022-2029. See *Bell-cord*
 175. 2030-2037. See *Bell-cord*
 176. 2038-2045. See *Bell-cord*
 177. 2046-2053. See *Bell-cord*
 178. 2054-2061. See *Bell-cord*
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 180. 2070-2077. See *Bell-cord*
 181. 2078-2085. See *Bell-cord*
 182. 2086-2093. See *Bell-cord*
 183. 2094-2101. See *Bell-cord*
 184. 2102-2109. See *Bell-cord*
 185. 2110-2117. See *Bell-cord*
 186. 2118-2125. See *Bell-cord*
 187. 2126-2133. See *Bell-cord*
 188. 2134-2141. See *Bell-cord*
 189. 2142-2149. See *Bell-cord*
 190. 2150-2157. See *Bell-cord*
 191. 2158-2165. See *Bell-cord*
 192. 2166-2173. See *Bell-cord*
 193. 2174-2181. See *Bell-cord*
 194. 2182-2189. See *Bell-cord*
 195. 2190-2197. See *Bell-cord*
 196. 2198-2205. See *Bell-cord*
 197. 2206-2213. See *Bell-cord*
 198. 2214-2221. See *Bell-cord*
 199. 2222-2229. See *Bell-cord*
 200. 2230-2237. See *Bell-cord*
 201. 2238-2245. See *Bell-cord*
 202. 2246-2253. See *Bell-cord*
 203. 2254-2261. See *Bell-cord*
 204. 2262-2269. See *Bell-cord*
 205. 2270-2277. See *Bell-cord*
 206. 2278-2285. See *Bell-cord*
 207. 2286-2293. See *Bell-cord*
 208. 2294-2301. See *Bell-cord*
 209. 2302-2309. See *Bell-cord*
 210. 2310-2317. See *Bell-cord*
 211. 2318-2325. See *Bell-cord*
 212. 2326-2333. See *Bell-cord*
 213. 2334-2341. See *Bell-cord*
 214. 2342-2349. See *Bell-cord*
 215. 2350-2357. See *Bell-cord*
 216. 2358-2365. See *Bell-cord*
 217. 2366-2373. See *Bell-cord*
 218. 2374-2381. See *Bell-cord*
 219. 2382-2389. See *Bell-cord*
 220. 2390-2397. See *Bell-cord*
 221. 2398-2405. See *Bell-cord*
 222. 2406-2413. See *Bell-cord*
 223. 2414-2421. See *Bell-cord*
 224. 2422-2429. See *Bell-cord*
 225. 2430-2437. See *Bell-cord*
 226. 2438-2445. See *Bell-cord*
 227. 2446-2453. See *Bell-cord*
 228. 2454-2461. See *Bell-cord*
 229. 2462-2469. See *Bell-cord*
 230. 2470-2477. See *Bell-cord*
 231. 2478-2485. See *Bell-cord*
 232. 2486-2493. See *Bell-cord*
 233. 2494-2501. See *Bell-cord*
 234. 2502-2509. See *Bell-cord*
 235. 2510-2517. See *Bell-cord*
 236. 2518-2525. See *Bell-cord*
 237. 2526-2533. See *Bell-cord*
 238. 2534-2541. See *Bell-cord*
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 241. 2558-2565. See *Bell-cord*
 242. 2566-2573. See *Bell-cord*
 243. 2574-2581. See *Bell-cord*
 244. 2582-2589. See *Bell-cord*
 245. 2590-2597. See *Bell-cord*
 246. 2598-2605. See *Bell-cord*
 247. 2606-2613. See *Bell-cord*
 248. 2614-2621. See *Bell-cord*
 249. 2622-2629. See *Bell-cord*
 250. 2630-2637. See *Bell-cord*
 251. 2638-2645. See *Bell-cord*
 252. 2646-2653. See *Bell-cord*
 253. 2654-2661. See *Bell-cord*
 254. 2662-2669. See *Bell-cord*
 255. 2670-2677. See *Bell-cord*
 256. 2678-2685. See *Bell-cord*
 257. 2686-2693. See *Bell-cord*
 258. 2694-2701. See *Bell-cord*
 259. 2702-2709. See *Bell-cord*
 260. 2710-2717. See *Bell-cord*
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 268. 2774-2781. See *Bell-cord*
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 271. 2798-2805. See *Bell-cord*
 272. 2806-2813. See *Bell-cord*
 273. 2814-2821. See *Bell-cord*
 274. 2822-2829. See *Bell-cord*
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 290. 2950-2957. See *Bell-cord*
 291. 2958-2965. See *Bell-cord*
 292. 2966-2973. See *Bell-cord*
 293. 2974-2981. See *Bell-cord*
 294. 2982-2989. See *Bell-cord*
 295. 2990-2997. See *Bell-cord*
 296. 2998-3005. See *Bell-cord*
 297. 3006-3013. See *Bell-cord*
 298. 3014-3021. See *Bell-cord*
 299. 3022-3029. See *Bell-cord*
 300. 3030-3037. See *Bell-cord*
 301. 3038-3045. See *Bell-cord*
 302. 3046-3053. See *Bell-cord*
 303. 3054-3061. See *Bell-cord*
 304. 3062-3069. See *Bell-cord*
 305. 3070-3077. See *Bell-cord*
 306. 3078-3085. See *Bell-cord*
 307. 3086-3093. See *Bell-cord*
 308. 3094-3101. See *Bell-cord*
 309. 3102-3109. See *Bell-cord*
 310. 3110-3117. See *Bell-cord*
 311. 3118-3125. See *Bell-cord*
 312. 3126-3133. See *Bell-cord*
 313. 3134-3141. See *Bell-cord*
 314. 3142-3149. See *Bell-cord*
 315. 3150-3157. See *Bell-cord*
 316. 3158-3165. See *Bell-cord*
 317. 3166-3173. See *Bell-cord*
 318. 3174-3181. See *Bell-cord*
 319. 3182-3189. See *Bell-cord*
 320. 3190-3197. See *Bell-cord*
 321. 3198-3205. See *Bell-cord*
 322. 3206-3213. See *Bell-cord*
 323. 3214-3221. See *Bell-cord*
 324. 3222-3229. See *Bell-cord*
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 326. 3238-3245. See *Bell-cord*
 327. 3246-3253. See *Bell-cord*
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 331. 3278-3285. See *Bell-cord*
 332. 3286-3293. See *Bell-cord*
 333. 3294-3301. See *Bell-cord*
 334. 3302-3309. See *Bell-cord*
 335. 3310-3317. See *Bell-cord*
 336. 3318-3325. See *Bell-cord*
 337. 3326-3333. See *Bell-cord*
 338. 3334-3341. See *Bell-cord*
 339. 3342-3349. See *Bell-cord*
 340. 3350-3357. See *Bell-cord*
 341. 3358-3365. See *Bell-cord*
 342. 3366-3373. See *Bell-cord*
 343. 3374-3381. See *Bell-cord*
 344. 3382-3389. See *Bell-cord*
 345. 3390-3397. See *Bell-cord*
 346. 3398-3405. See *Bell-cord*
 347. 3406-3413. See *Bell-cord*
 348. 3414-3421. See *Bell-cord*
 349. 3422-3429. See *Bell-cord*
 350. 3430-3437. See *Bell-cord*
 351. 3438-3445. See *Bell-cord*
 352. 3446-3453. See *Bell-cord*
 353. 3454-3461. See *Bell-cord*
 354. 3462-3469. See *Bell-cord*
 355. 3470-3477. See *Bell-cord*
 356. 3478-3485. See *Bell-cord*
 357. 3486-3493. See *Bell-cord*
 358. 3494-3501. See *Bell-cord*
 359. 3502-3509. See *Bell-cord*
 360. 3510-3517. See *Bell-cord*
 361. 3518-3525. See *Bell-cord*
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 363. 3534-3541. See *Bell-cord*
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 366. 3558-3565. See *Bell-cord*
 367. 3566-3573. See *Bell-cord*
 368. 3574-3581. See *Bell-cord*
 369. 3582-3589. See *Bell-cord*
 370. 3590-3597. See *Bell-cord*
 371. 3598-3605. See *Bell-cord*
 372. 3606-3613. See *Bell-cord*
 373. 3614-3621. See *Bell-cord*
 374. 3622-3629. See *Bell-cord*
 375. 3630-3637. See *Bell-cord*
 376. 3638-3645. See *Bell-cord*
 377. 3646-3653. See *Bell-cord*
 378. 3654-3661. See *Bell-cord*
 379. 3662-3669. See *Bell-cord*
 380. 3670-3677. See *Bell-cord*
 381. 3678-3685. See *Bell-cord*
 382. 3686-3693. See *Bell-cord*
 383. 3694-3701. See *Bell-cord*
 384. 3702-3709. See *Bell-cord*
 385. 3710-3717. See *Bell-cord*
 386. 3718-3725. See *Bell-cord*
 387. 3726-3733. See *Bell-cord*
 388. 3734-3741. See *Bell-cord*
 389. 3742-3749. See *Bell-cord*
 390. 3750-3757. See *Bell-cord*
 391. 3758-3765. See *Bell-cord*
 392. 3766-3773. See *Bell-cord*
 393. 3774-3781. See *Bell-cord*
 394. 3782-3789. See *Bell-cord*
 395. 3790-3797. See *Bell-cord*
 396. 3798-3805. See *Bell-cord*
 397. 3806-3813. See *Bell-cord*
 398. 3814-3821. See *Bell-cord*
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 400. 3830-3837. See *Bell-cord*
 401. 3838-3845. See *Bell-cord*
 402. 3846-3853. See *Bell-cord*
 403. 3854-3861. See *Bell-cord*
 404. 3862-3869. See *Bell-cord*
 405. 3870-3877. See *Bell-cord*
 406. 3878-3885. See *Bell-cord*
 407. 3886-3893. See *Bell-cord*
 408. 3894-3901. See *Bell-cord*
 409. 3902-3909. See *Bell-cord*
 410. 3910-3917. See *Bell-cord*
 411. 3918-3925. See *Bell-cord*
 412. 3926-3933. See *Bell-cord*
 413. 3934-3941. See *Bell-cord*
 414. 3942-3949. See *Bell-cord*
 415. 3950-3957. See *Bell-cord*
 416. 3958-3965. See *Bell-cord*
 417. 3966-3973. See *Bell-cord*
 418. 3974-3981. See *Bell-cord*
 419. 3982-3989. See *Bell-cord*
 420. 3990-3997. See *Bell-cord*
 421. 3998-4005. See *Bell-cord*
 422. 4006-4013. See *Bell-cord*
 423. 4014-4021. See *Bell-cord*
 424. 4022-4029. See *Bell-cord*
 425. 4030-4037. See *Bell-cord*
 426. 4038-4045. See *Bell-cord*
 427. 4046-4053. See *Bell-cord*
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rounds has been recommended by the M. C. B. Association. See figs. 656-7 and *Ladder-round*.

Berth. 1, 2, figs. 676-7. A bed in a *Sleeping-car*, which see; also, the shelf or support on which the bed rests. There are two such beds in the space occupied by two double seats, which is called a *section*. The *lower berth* is made upon the seats and the upper one on a shelf, which can be raised or folded up out of the way in day-time, as shown at 3, 3. See *Lower berth*. *Upper berth*.

Berth-arm. A *Berth-brace*, which see.

Berth-bolt. See *Berth-latch bolt*.

Berth-brace. 4, figs. 676-81. A metal rod, chain or wire rope attached to the side and near the top of a sleeping-car, and at the other end to the outer edge of a berth, which is supported by the brace. When a metal rod is used, it usually has a joint so that it can fold up like an ordinary two-foot rule, when the berth is raised up.

Berth-brace eye. 5, figs. 676-81. A metal plate with suitable lugs for fastening the brace to the top of the car, or to the berth. The brace is attached to the lugs by a pin, and the plate is screwed fast either to the side of roof of the car or to the berth. The former is called a *Berth-brace upper-eye*, and the latter a *Berth-brace lower-eye*.

Berth-bracket. Figs. 12, 86, etc. A bracket on which an upper-berth of a sleeping-car rests when lowered and the bed is made and in use.

Berth-catch (emigrant sleeping-berths). H, figs. 682-5 and 1289-91.

Berth-chain. 6, figs. 676-8. An equivalent for a *berth-spring rope*, which see.

Berth-chain pulley. 7, fig. 678. A pulley attached to the roof of a sleeping-car, over which a berth-chain runs.

Berth-curtain. 13, fig. 678. A curtain hung in front of a sleeping-car section to hide the occupants from sight. In ordinary sleeping-cars a single curtain covers both berths. In the Mann boudoir cars, figs. 680-1, there are separate *upper* and *lower* curtains for each berth.

Berth-curtain hook. A metal hook attached to a berth-curtain, and by which the latter is hung on a rod above the berths; usually covered with leather to prevent rattling.

Berth curtain-rod. 14, figs. 679-81. A rod usually made of metal tubing, fastened above a section of a sleeping-car and to which a *berth-curtain* is hung.

Berth curtain-rod acorn. Figs. 1269-78. See *Berth curtain-rod tip*.

Berth curtain-rod bolt. Figs. 1267; 1, 1271-2. A small vertical bolt, usually tipped with an acorn, fastening the *curtain-rod* in the *coupling* on the *bracket*.

Berth curtain-rod bracket. 15, figs. 676-81, 1271-2. A metal bracket attached to the deck side of a sleeping-car, which forms a support for a berth curtain-rod. Such brackets usually have a coat and hat hook attached to them. A *hanger*, fig. 1265, is sometimes used as a substitute for a bracket at certain points.

Berth curtain-rod coupling. 1, figs. 1271-2, 1265. A fastening by which a berth curtain-rod of a sleeping-car is secured to a bracket. It usually consists of a bolt or screw.

Berth curtain-rod hanger. Fig. 1265. See *Berth curtain-rod*.

Berth curtain-rod socket. Figs. 1270 and 1274. A metal flanged ring which is fastened to some part of a sleeping-car to carry the berth curtain-rod, also called *berth curtain-rod bushing*.

Berth curtain-rod tip, or acorn. Figs. 1267-9, 1278. See *Acorn*.

Berth fixtures, etc. Figs. 1231 and 1260.

Berth-handle. A *Berth-latch handle*, which see.

Berth head-board. 16, figs. 676-81. See *Head-board*.

Berth-hinge. Figs. 1237-40. A hinge or joint by which the back edge of an upper berth of a sleeping-car is attached to the side of a car. They are distinguished as *loose* and *fast*.

Berth-hinge bracket (emigrant sleeping-berths). Figs. 682-5.

Berth-hinge bushing. Fig. 1238. A hollow metal socket in which the spindle of a loose *berth-hinge* works.

Berth-latch. 12, figs. 676-81, 1261-4. A spring bolt for holding the upper berth of a sleeping-car up in its place when not in use. To obviate the danger of the berth shutting up in case of overturning of the car, the *safety-berth rope* and attachments, figs. 676-8, are used, but *safety-berth latches*, figs. 1261-4, have recently been introduced to obviate the necessity of using a *safety-rope*. See *Safety-berth-latch*.

Berth-latch bolt. Fig. 1258. The bar or pin of a berth-latch which engages in a corresponding strike-plate or keeper, to hold the berth up.

sleeping-berths.) **M**, figs. shoulder carried upon the port to the outer edge of the

sleeping-berths.) **N**, figs.

44.

boudoir car.) 14, figs. 680-1. t sleeping-berths.) **L**, figs.

Fig. 1286.

sleeping-berths.) **K**, figs.

on boudoir car.) 11, figs.

place attached to car. 42, ch.

which see.

figures or numbers, usually or numbering the berths or y are now often of inlaid

st.

1-81, 1246-7. A wire rope a sleeping-car to the fixed prevent accidental closing of overturning of the car. or berth by a *berth safety*-berth by inserting a *knob*

spring is now often concealed behind side of the car.

Berth-spring frame. 9, figs. 676-81;

metal support which holds a berth-spring

Berth-spring fusee. 2, figs. 1249-51.

Berth-spring lug, or clip. Fig. 1250. The end of a berth-chain is fastened to

Berth-spring rope. 10, figs. 676-81, s

A cord, usually made of wire, which upper berth of a sleeping-car at one berth-spring at the other, and by which the spring is transmitted to the berth acting its weight. Instead of the (which see) is sometimes used.

Berth-stop (emigrant sleeping-cars). **F** ing-plate carried on upper berth at **K**, fig. a bearing on the *berth-rest M*.

Berth striker-plate. A *Berth-latch keeper*

"**Best**" sun-burner. Fig. 888. See *Su*

Beveled-bushing. Figs. 706-8. See *Be* **Beveled-rack** (Ormsby sash-balance, which

6. A rack, which see, with a slope side to check rattling of the sash.

Beveled-washer. Fig. 1874. A washer used as a bearing for rods which stand at an angle to a surface on which the nut or bolt head bears. Two such washers which come near together are called *one piece* and are then called *one piece*

ing the direction of their flow usually from a horizontal to a vertical current. Hence—

Bibb-cock. Figs. 1591-3. Literally, a cock with a curved nozzle or spout, but commonly restricted to a cock with a plain valve without springs, moved by the hand only.

Bi-colored signal lantern (Burrell). Figs. 972-3. See *Burrell reversible signal lantern*.

Bissell heater. Figs. 1349-1404. One of the hot-air heaters, taking in cold air by a *wind-scoop* and distributing it by pipes along the floor. Four different styles are manufactured, increasing in elaborateness from a plain stove, as explained with the engravings.

Bissell stop-key journal bearing. Figs. 2005-9. One with a projecting shoulder on the journal-bearing key to take up the end-thrust, so as to dispense with a collar. See *Journal bearing*. Also called *stop-wedge journal-bearing*. See *Journal-bearing key*.

Bit (of a key). Figs. 1029, 1178, etc. The part of a key which enters the lock and acts upon the bolt and tumblers. The bit consists of the *web* and *wards*. The *web* is the portion left after the wards are cut out. The *wards* (of a key) consequently are those parts of the bit which are not there and fit over the *wards* of a lock which see. Some bits, as in fig. 1178, have no wards.

Bit (of a padlock). E, figs. 1029-30. The forward end of the sliding-bolt, which engages with the shackle in the act of locking.

Bit or jaw-bit (passenger car trucks). 77, figs. 1955-73. A short bar closing the mouth of the jaw of a pedestal after inserting the journal-box.

Blackstone car-coupler. A form of platform invented by Mr. T. B. Blackstone, president of the Chicago & Alton Railroad, and used only on that road. It has projecting bars, which engage with the opposite platform and accomplishes somewhat similar ends to the Janney or Miller platforms in a manner less generally satisfactory.

Blake butt. An indefinite term, meaning in general a plain cast-iron butt-hinge, of somewhat more than ordinary quality, having a washer, but no acorns nor screw-pin, as in fig. 789.

Blank hinge. Fig. 790. A hinge which permits the door to swing open in either direction. It is intended as a substitute for one of a pair of *double-acting spring hinges*, which see, as being lighter and cheaper.

Bleeding valve (for Westinghouse brake). Fig. 326; 18, figs. 324-5. Another term for the *cylinder release-cock*. In popular language, the operation of releasing the brake pressure by operating the *bleeding-valve* or *release-cock* of the brake cylinder without going through the usual process of admitting pressure to the brake-pipe is termed *bleeding the brakes*. It is the only method of release when the engine is disconnected.

Blind. Figs. 155-185, etc. A *Window-blind*, which see. They are sometimes *single*, but usually *double*, and then distinguished as *lower* and *upper*. *Flexible window-blinds* (Paul and Wilson, which see, figs. 1645-7) are also in use.

Blind lifts, bushing bolt, etc. Figs. 1607-9, 1663-82. See *Window-blind lift*, etc.

Blizzard. A fierce storm with high wind. Hence the trade name *blizzard signal-light*, figs. 964-6, to designate one of extra quality, with careful provisions to prevent extinction by wind. See *Signal-light*.

Block. 1. "A heavy piece of timber or wood, usually with one plane surface; or it is rectangular and rather thick than long."—*Webster*.

2. Fig. 1898. "A pulley or system of pulleys mounted on its frame or shell, with its band or strap. A block consists of one or more pulleys or sheaves, in a groove of which the rope runs, fastened in a shell or frame by pins, on which they revolve; of a shell or frame inclosing the pulley or pulleys; and of a strap or band, consisting of a rope, encompassing the shell, and attached by an eye of rope or a hook to some object."—*Ed. Ency.*

The interior wheels are termed *sheaves*, which latter term is often used to designate the whole block or pulley, but incorrectly. A *snatch-block* is a block with only one sheave and with an opening at the side for the ready insertion and removal of the rope. Blocks without this opening, however, are sometimes loosely termed *snatch-blocks*.

See *Body-bolster spacing-block*.

Body-bolster truss-block.

Brake-block.

Buffer-block.

Brake-cylinder block.

Distance-block.

Floor-timber distance-block.

Follow-plate block.

Guide-block.

Stop-block.

Bumper-block.

Centre-plate block.

Dead-block.

Swing-hanger friction block.

Transom bearing-block.

Transom truss-block

Truck-bolster guid

n bunks.

ode of securing together the
k by blocks of wood glued

The method is largely used
where great strength is not

blocking-strip. 204, figs.

fig. 1048. A device carried
ight signals. It is so con-
nall piston ignites the blue

owed thin, and of consider-
pared with the thickness,
purposes."— *Webster.*

Letter-board.

Roof-boards.

Roof running-board.

Running-board.

Seat-back board.

Soffit-board.

Splash-board.

scia Tread-board.

single, figs. 664-5. Double,
arm, usually meaning either
cards only, with or without
cking, or a single layer of
metal. The Winslow and
er the metal sheets.

in for cooking and smoking

body which is supported on two truss
plate and side-bearings, which rest
fastened to these bolsters. Such
wood, or of iron trussed, or of wood
A body-bolster is sometimes called
simply *transom*, but the term body
generally applicable, if used at all,
passing from side to side of the car
also known as *cross-frame tie-timber*
A part somewhat analogous to a body
of logging-cars, figs. 1727-30; but
reach connecting the trucks, and is to
sustain the loads. The body-bolster
are sometimes very elaborate struc-
iron body-bolster and *Snow body-bolster*
latter being the equivalent of a double
but in the form of an X. Iron body
form of a truss, the top member be-
tension-bar and the bottom as the
two being held apart by small car
bolster thimbles.

Body-bolster compression-bar. 1, fig.
bolster.

Body-bolster spacing-block. 12', fig.
Body-bolster.

Body-bolster tension-bar. 2, fig.
bolster.

Body-bolster thimble. 3, fig. 217. See

Body-bolster truss (iron 6-wheel truck

above the centre of the bolster over the *truss-rod bearing* so as to form a truss; generally two or more are used for each bolster.

Body-bolster truss-rod bearing. 5, figs. 315, etc. See *Body-bolster truss-rod*.

Body-bolster truss-rod washer. 14, figs. 82-6; 12, figs. 155-185; 7, fig. 315. An iron bearing-plate on the end of a body-bolster; often made to take two or more rods.

Body-brace. 33, figs. 84-105; 51, figs. 155-165. An inclined beam or strip of timber in the side or end frame of a car-body, which acts as a brace. A substitute for body-braces as well as for truss-rods is the *Challender truss*, fig. 185b, which see. A *compression beam brace*, 2, fig. 644, answers to the definition of a body-brace, but is a *long brace*, constituting with the *compression-beam* a single truss or arch from bolster to bolster. A *body-brace* is an oblique brace in one of several panels included in this space. See *Body-counterbrace*. *End body-brace*, 35, figs. 85-104, and *Side body-brace*.

Body brace-rod. 34, figs. 89, 93; 52, figs. 177-8. An inclined iron rod in the side or end of a car-body frame, which acts as a brace. They are distinguished as *end* and *side body brace-rods*. A *brace straining-rod* is a short vertical rod in the side of a passenger car under the window.

In figs. 159-60, 167 should read *inverted body truss-rod*, or *hog-chain rod*, and not *body brace-rod*.

Body centre-plate. 8, figs. 315-7; 17, figs. 182-93; 15, figs. 156-81. The upper of the two *centre-plates*, which see, through which the *king-bolt* or *centre-pin* passes.

Body check-chain eye. 19, figs. 158-85. An eye-bolt or clevis for fastening a check-chain to the car-body. See also *Truck check-chain eye*.

Body check-chain hook. An iron hook on the *check-chain* which enters into the *check-chain eye*.

Body counterbrace. 37, figs. 83, 84, 183, 186; 55, figs. 135, 161-5; 3, fig. 644; 2, fig. 645. A brace in the side frame of a car-body between the bolsters and end of the car. These braces are inclined in a direction opposite to those between the bolster and centre of the car. Sometimes, as in fig. 159, counterbraces are inserted in the central portion of the car between the two bolsters. They are then termed *centre counter-braces*. See *Counter-brace* and *framing*.

Body counterbrace rod. 37', figs. 82-101; 56, fig. 177b.

An inclined iron rod in the side-frame of a car-body, between the bolster and the end of the car. The body counterbrace-rod is sometimes a continuous rod running from one end of the car to the other over the supports resting on the body-bolster, as 167, fig. 159. It is then, more properly speaking, an *inverted truss-rod* or *hog-chain rod*, which see. Also called *continuous body-brace rod*.

Body counterbrace tie-rod. 176, fig. 93. An erroneous reference. Name should read *Inside-lining stud*.

Body-cushion (English). 186, figs. 204-5. See *India-rubber body-cushion*.

Body hand-rail. 44, figs. 155-188; 113, figs. 1843-5. An iron rod or bar attached to the end of passenger cars for persons to take hold of in getting on or off the cars; not to be confused with *Platform-rail*, which see.

Body-knee (English). 82, figs. 116-9. No American equivalent. A heavy wrought-iron knee, securing the sides of the body to the *under-frame*, and keeping them at right angles to one another.

Body-post (freight-car bodies). 42, figs. 83-142. An upright timber which is framed into the sill and plate of a freight car. The body-posts and *corner-posts* form the vertical members of the side-frame of a car-body. In passenger cars such posts are called *Window-posts*, which see.

Body-post-pocket. 42', figs. 93-6; 35, figs. 109-12, etc. See *Pocket*.

Body queen-post. 22, figs. 155-6, 161-4. An iron rod, bar, or casting, on the under side of a car-body and against which the *body truss-rods* bear. It is often stiffened laterally by a *body queen-post stay*. See also *Queen-post*.

Body queen-post stay. 2, fig. 324; A, fig. 163. See *Body queen-post*.

Body side-bearings. 16, figs. 83-138; 14, figs. 163-115. The upper one of the two *side-bearings*, which see, attached to the body-bolsters.

Body-spring. A *Bolster-spring*, which see.

Body transom. 22, figs. 82-93, etc. A name sometimes given to the *needle-beams* or *cross-frame tie-timber*, which see, bolted to the under side of the sills.

Body truss-rod. 19, figs. 82-136; 20, figs. 155-181, 239. A long rod under a car-body to truss it, and prevent it from sagging in the centre. This rod is nearly always

21, figs. 82-136. A cast or under side of a truss-block or , serving the purpose of a *Body*

0, figs. 88-9, 118-5, etc.; 21, wood or casting which forms a bolster, and on which a con- rs. Properly speaking, a *saddle* for a pair of rods with a cen- 1756, but it is not now re-

ing *car-truck*, which see. All ars and coaches are what are *arriages*, or *wagons*.

A vehicle for passenger service e fastest trains. The body is vided into compartments, with m 30 to 80 passengers. It is el trucks. See also *Carriage*. ars). A horizontal timber at- e inside of the car, a short dis- he *bogus-plates* support hori- l *meat timbers* or *hanging bars*, ed for hanging meat.

7, fig. 1472. See engravings of lly, for similar parts.

six or eight wheeled car having e ends with a drop-down plat-

such bolsters as about every arrival Car-Builders' Convention, 1884, the adopting the swing-bolster for a st truck was 82 to 80.

Bolster-bridge (six-wheel truck). 62 *Side-bearing bridge*, which see.

Bolster distance-block. A' figs. 121- *body-bolster thimble*. 3, fig. 217-9.

Bolster jack-screws (wrecking cars). screws attached to the spring-plank taking the load off the springs and truck and car body one rigid structu of the wrecking-car is in use. *Tongs* and detached jack-screws are used same end, as figs. 80, 144.

Bolster-plates (passenger car trucks).] iron plates bolted to the sides of wc to strengthen them.

Bolster-springs. 80, figs. 1907-68 an main springs of a car, carried on th supporting the *truck-bolster* on which car-body rests.

Bolster-spring cap. 75, figs. 1915 *Spring-plate*.

Bolster-spring seat. 74, figs. 1915 *Spring-plate*.

Bolster truss-block. A timber serving to fill a vacant space between the *bol- plate*. There are two : a *Body-bolster*

anything in its place ; ordinarily a *bolt* has a head on one end and a screw and nut on the other, while a *rod* has a nut on both ends, as shown in figs. 1865-76, etc.

Various forms of bolts, which see for further definition, are as follows:

<i>Carriage-bolt</i> , fig. 1867.	<i>Key-bolt</i> , fig. 1871.
<i>Eye-bolt</i> , figs. 1872, 1797.	<i>Lug-bolt</i> , fig. 1869.
<i>Jaw-bolt</i> , fig. 1796.	<i>Machine-bolt</i> , figs. 1865-6.
<i>Joint-bolt</i> , fig. 1876.	<i>Strap-bolt</i> , or U-shaped bolt, fig. 1870.

For bolts whose names are derived from the purpose for which they serve, see:

<i>Box-bolt</i> .	<i>Journal-box-cover bolt</i> .
<i>Brake safety-chain bolt</i> .	<i>King-bolt</i> (or centre-pin).
<i>Column-bolt</i> .	<i>Piston-follower bolt</i> .
<i>Discharge-valve stop-bolt</i> .	<i>Reversing-valve plate bolt</i> .
<i>Draft-bolt</i> (Janney).	<i>Stake-pocket U-bolt</i> .
<i>Drawbar-bolt</i> .	<i>Stop-bolt</i> .
<i>Hub-bolt</i> .	<i>Tire-bolt</i> .
<i>Journal-box bolt</i> .	

2. (Locks and latches.) A bar which enters the keeper or strike-plate and effects the lock.

See <i>Berth-latch bolt</i> .	<i>Door-sash bolt</i> .
<i>Cupboard-bolt</i> .	<i>Door-sash-lock bolt</i> .
<i>Door-latch bolt</i> .	<i>Seat-lock bolt</i> .
<i>Door-lock bolt</i> .	<i>Sofa-bolt</i> .

3. Figs. 758-81, etc. A *door-bolt*, which see, moved in slides directly by the hand to fasten an opening. See also:

<i>Barrel door-bolt</i> .	<i>Head-board bolt</i> .
<i>Flush-bolt</i> .	<i>Window-blind bolt</i> .

Bolt drawbar. Figs. 395-449, etc. A drawbar to which the draw-spring is attached by a bolt passing through it. Also called *Spindle drawbar*.

Bolt-stop (Seat-lock). 5, figs. 1176-7. A small pin passing through the bolt to check excessive withdrawal.

Bonnet (passenger cars). A *Platform-hood*, which see.

Boom (of a derrick or crane). 6, figs. 77-78 ; B, fig. 145 ; D₁, figs. 151-3. Also called *jit*. The main inclined compression member carrying the hoisting gear and abutting at its foot against a *boom-shoe* or directly against the mast. Its upper end is supported by stay-rods or tension-rods which, in a crane, are of fixed length, and, in a derrick, of varying length, capable of adjustment. See *Derrick*.

Boom-cap clevis (of a derrick or crane). L, figs. 151-3.

A *clevis*, which see, sometimes attached to the upper end of the boom, to which the fixed end of the *hoisting-rope* is attached. In other cases, as at 4, figs. 77-8, the clevis for this purpose is carried on the hoisting-block.

Boom-sheave (of a derrick or crane). E, figs. 151-3; also 5, figs. 77-8. A sheave carried at the upper extremity of the boom over which the hoisting chain passes.

Boom-shoe (of a derrick or crane). 16, figs. 77-78 ; F^a, figs. 151-3. A casting carried at the foot of the mast and constructed so as to be able to revolve against the boom base. It is supported by *boom-shoe rods*.

Boom-shoe rods (of a derrick or crane). 16, figs. 77-8 ; F, figs. 151-3. Rods attached to the *head-block* or cap at the top of the mast and supporting the boom-shoe.

Boom-shoe rollers (of a derrick or crane). B, figs. 151-3. Rollers at the foot of the mast upon which the boom-shoe revolves.

Boss, or hub (of a steel-tired wheel). Figs. 2151-2180. The central portion through which the axle passes. *Boss* is the usual English term, but little used in the United States.

Bottle-breaking head (Babcock fire extinguisher, which see). Fig. 1044. It breaks the acid-bottle by screw-pressure.

Bottom. "The lowest part of anything ; as the bottom of a well, vat, or ship."—*Webster*.

See <i>Alcove-bottom</i> .	<i>Water-bottom</i> .
<i>Candle-lamp bottom</i> .	<i>Fire-proof bottom</i> .
<i>Drop-bottom</i> .	<i>Lamp-bottom</i> .
<i>Extreme bottom</i> .	<i>Seat-bottom</i> .

Bottom-arch-bar. An *inverted arch-bar*. The *pedestal tie-bar* is sometimes called bottom arch-bar, as in fig. 1788. See *Arch-bar*.

Bottom-chord (of trusses). See *Lower-chord*. Neither term is regularly used to designate any part of car trusses, but the *side-sills* are bottom chords in trussed side-frames.

Bottom cross-piece (English). 93, figs. 205-206. The transverse-piece in the *under framing*, which see, supporting the floor and partition. Also called *bottom cross-bar*.

Bottom cylinder-head, (Westinghouse driving-wheel brake). 4, figs. 306, 314-5. A circular cast-iron plate or cover for the lower end of the cylinder. The piston-rod works through it.

99, figs. 205 and 206. The transverse end-piece of a passenger vehicle.

109, figs. 204, 205. A part of a carriage, forming the bottom heater, which see). 83, fig. 1409. (English). 105, fig. 205. American in a carriage, a part of the body the panel, which is pinned to it.

door). 147, figs. 158-85; 5, fig. orizontal bar or member of a

for Creamer brake, which see).

91, figs. 204-207. The lower the body of a passenger vehicle. se (English). 144, fig. 206. A ring together the side and end of the body framing of a

sh). 123, fig. 205. The lower the body of a carriage.

er heater). 1, figs. 1801, 1802. somewhat like a dinner plate.

ear heater). 14, figs. 1486-90, g which rests on the floor of a

present tendency is to continual and capacity. They are usual height with *inside lining*, and pr grain-tight *grain-door*. See *Car Box-cover*. See *Journal-box cover* Box-cushion. Figs. 1205-23. A ci seats made on a wooden frame. *squab cushion*; now little used, v the seat. Box-cushions are some or other elastic material alone, bu are used in addition. Fig. 1206 s cushion.

Box-guide. See *Journal-box guid* Box-lid. Figs. 1997-2020. See *Jou* and *Hewitt journal-box lid*.

Box-packing. *Journal-packing*, v Box-room (on axle). The *dust-gua*

Box-steps. Fig. 686. Passenger wooden stringers or sides. Ordin *form steps*.

Box stock-car. Figs. 8-9. An o large grated openings for ventilati Little used except for horses. Se

Brace. 8, fig. 2182, and figs. 82-18 rod or bar of a frame, truss, gir two or more of the points where structure are connected together them from turning about their makes the structure incapable of

inclination of their top to a person standing facing the car.

See *Berth-brace*.
Body-brace.
Brake-lever bracket
brace.
Brake-shaft brace.
Brake-shaft-step
brace.
Compression-beam
brace.

Corner-post brace.
Door-brace.
End body-brace.
Floor-timber brace.
Pedestal-brace.
Roof-brace.
Seat-bracket brace.
Side-lamp brace.
Stop-brace.

Brace-pocket. 39, figs. 89, 93; 40, figs. 182-186; 41, figs. 182, 184, 186, 188. A casting which forms a socket for holding the ends of braces, especially of car-bodies. See *Brace*, also *double-brace pocket*.

Brace-rod. 34, figs. 89, 93; 52, figs. 177-8; 10, fig. 2185. An inclined iron rod which acts as a brace. A vertical rod acting in conjunction with a brace, is called a *sill-and-plate rod*, or, in passenger-cars, for short rods below the window, *brace straining-rod*. See *Body-brace rod*. *Counterbrace-rod*. *Propelling-lever brace-rod*.

Brace-rod washer. 57, figs. 177-8, etc. A bearing-plate for the nut or head of a brace-rod, sometimes made a *triangular* or *beveled* shape, which see, and sometimes a flat bar of iron, bent to fit into a notch cut in the timber, as shown at 38, figs. 89, 93, 182, 186.

Brace straining-rod (passenger-car framing). 53, figs. 155-165. A vertical iron rod in the side or end frame of a car-body by which the upper end of a brace is connected or tied to the sill of the car. The brace-rods are members of the truss, of which the sill, braces, posts or plates, etc., form parts. Such rods often have hook-heads at the upper ends against which the braces bear, and nuts at the lower ends by which they are screwed up, and are thus brought into a state of tension and the braces into compression. An equivalent in freight service is the *sill and plate rod*.

Bracket. 1. "An angular stay in the form of a knee to support shelves and the like."—*Webster*.

See *Arm-rest bracket*.
Basket-rack bracket.
Bell-cord strap-hanger
bracket.
Bell-strap bracket.
Berth bracket.
Berth-corner bracket.
Berth-curtain-rod
bracket.

Lamp bracket.
Lamp-chimney bracket.
Longitudinal-step
bracket.
Post-bracket.
Release-spring bracket.
Running-board
bracket.
Scheme-rod bracket.

Brake-lever bracket.
Brake-shaft bracket.
Brake-step bracket.
Coupling-spring
bracket.
Cylinder-lever
bracket.
Door-track bracket.
Hand-rail bracket.
Inside-hand-rail
bracket.

Seat-bracket.
Seat-rail bracket.
Side-lamp bracket.
Signal-light bracket.
Sliding-door bracket.
Smoke-bell bracket.
Tender-spring bracket.
Towel-bracket.
Window-curtain
bracket.

2. (Iron framing for bridges or cars.) An L-shaped angle-plate riveted to each of two members which it is desired to connect at right angles to each other, as the *end-sill bracket*, C, figs. 146-150. A stronger form, little used in car construction, is by a triangular *Gusset-plate*, which see.

Bracket (of cast-iron wheels). Figs. 2125, 2184, etc. The stiffening ribs cast on the plate.

Bracket-arms (for lamp). Fig. 890. *Lamp-arms*, which see, which have a rectangular shoulder in them to carry the shade.

Bracket berth-hinge (emigrant sleeping berths). A, figs. 682-5. A berth-hinge with a shoulder to directly support the inner edge of the berth without relying on the hinge-pin.

Bracket gas-burner. A gas-burner attached to the side of a car.

Bracket-lamp. Figs. 859-71. A *Side-lamp*, which see.

Bracket-nut ("American" steam brake-valve). 9, figs. 860-2. A small *Spanner-nut*, which see.

Bracket studs and nuts ("American" steam tender-brake). 6, figs. 866-7. The means of attaching the brake-cylinder to a bracket on the tender. See *Stud*.

Brake, or brake-gear. Figs. 227-369. The whole combination of parts by which the motion of a car is retarded or arrested. Passenger-car brakes are now almost exclusively *atmospheric*, being either *air-brakes* operating by compressed air, or *vacuum brakes* operating by creating a vacuum. Of the latter are the *Eames* and *Smith* vacuum brakes. Of the former the most important by far is the *Westinghouse*, although the *Loughridge* is also used. The *Westinghouse* is now almost exclusively used in its *automatic* form, and by the term *Westinghouse brake* the *Westinghouse automatic brake* is now always referred to. The *Creamer* spring brake, figs. 263-5, designed for use in emergencies only, is now out of use.

brake-beams are either *inner-*
fig. 236. Inner-hung brakes
rod brakes, the brake-lever
which unites them being in
brakes, both steam and air,
any of the words in italics

Figs. 105-8, 228. A brake
rods or levers will interfere

hand-car). 2, figs. 1724-6. A
hoes, which see.

etc., etc.; figs. 146-7. Trans-
which the brake-block and
either *inner-hung* or *outer-*
specially in passenger service.
inner brake-beam.

A plate attached to a *brake-*
e-spring bears, designed to
ion of the spring.

figs. 1943, 1946, 1961. An eye-
ake-rod to a *brake-beam* on
-lever. They have threads
1, and usually a nut is placed
eam, which can be screwed
of the brake-shoes.

ake-lever fulcrum.
). 28, fig. 1720-3. A *Brake-*

figs. 105-8.

8. (English.) 63, figs. 116-7. See
wood being the material of which t

4. (Westinghouse driving-wheel br
Brake-block pin (Westinghouse drivi
fig. 832. A pin by which the *susp*
tached to the brake-block.

Brake-block pin-rod (Westinghouse d
27, figs. 322-3. A tie-rod connectin
opposite sides of the locomotive, to
of the coned wheels to throw the br
It is hung downward by a link to en
the ash-pan.

Brake-block suspending-link (We
wheel brake). 23, figs. 322-3. An i
the *suspending-stud* at the top and
pin at the bottom.

Brake-block suspending-plates (We
wheel brake). 24, figs. 322-323. V
bolted to the locomotive frame and
furnishing a support to the upper end
suspending-link.

Brake-block suspending-stud (Wes
wheel brake). 25, figs. 322, 323. Se

Brake-block tie-rod (Westinghouse dri
27, figs. 322-3. See *Brake-block pin-*

Brake-carrier. See *Brake-hanger car*

Brake-chain. See *Brake-shaft chain*.

Brake-chain worm. 160, figs. 155, 1

Brake-cord guide. Figs. 780-1. A guide similar to a bell-cord guide for the air-brake cord which passes through every car fitted with the Westinghouse automatic brake, and operates the *conductor's valve*, fig. 298.

Brake-cylinder (Westinghouse automatic brake). Figs. 292-309. A cast iron cylinder attached to the under side of the car-frame, fitted with two *heads* and a *piston*, against which the compressed air exerts its pressure to apply the brakes. The piston-rod was formerly attached to a *release-lever* to which a *release-spring*, exterior to the cylinder, was attached. In the gear at present in use the release-spring is coiled within the brake-cylinder, figs. 339-81, and pushes against the *cylinder-lever*, 7, fig. 335, or in the freight gear against the *floating-lever*, 4, fig. 339, through a *push-bar*, which see. In the freight gear the brake-cylinder, triple-valve and auxiliary reservoir are all combined in one part, figs. 352, etc. In the Eames vacuum brake a *diaphragm* takes the place of the brake-cylinder. In the Smith vacuum it is an accordion-like cylinder with stiffening interior ribs to prevent collapse under air-pressure.

2. (Westinghouse tender-brake.) 2, figs. 297-9, 307, 330. A cylinder similar to the above, except that the piston is provided with a long *piston-sleeve*, 6, to guide the *push-bar*, which see.

3. (Westinghouse driving-wheel brake.) Figs. 306, 314-5; 2, figs. 322-3. A cylinder attached to a locomotive in a vertical position between the driving-wheels. The force of the compressed air is transmitted to two *eccentric-levers*, which act against the *brake-heads* and thus apply the brakes. The main casting, 2, of the cylinder is called the *cylinder-body*.

Brake-cylinder block (Westinghouse freight brake-gear). 7, figs. 338-9. A stick for attaching the combined cylinder and auxiliary reservoir to the under side of the sills. See *Auxiliary-reservoir beam*, a similar part for passenger cars.

Brake-cylinder end-block (Westinghouse freight brake-gear). 8, figs. 338-9.

Brake-cylinder pipe (Westinghouse brake). 21, fig. 325. The pipe which connects the brake-cylinder with the triple-valve.

Brake-cylinder plate (Westinghouse freight brake). Figs. 338-43. The plate to which the brake-cylinder is bolted and by which it is attached to the sills.

Brake-dog. A *brake-pawl*, which see.

Brake-drum. A *brake-shaft drum*, which see.

Brake-equaliser block, or centre brake-lever block (Elder brake). 207, figs. 97-8. A block directly under the centre of the car to which the brake equalizing-lever or centre brake-lever is attached.

Brake equalising-lever (Elder brake). 209, figs. 97-101; 10, fig. 284. More properly, *Centre brake-lever*, which see.

Brake-equaliser strap. 206, figs. 97-8. A strap directly under the centre of the car serving as a fulcrum for the *centre brake-lever*.

Brake-finger. A *brake-pawl*, which see.

Brake foot-board. A *brake-step*, which see.

Brake hand-rail. 190, figs. 93-6, 252-4, 656-7. A hand-rail, on the roof of box and stock cars, usually made of gas-pipe, for the protection of brakemen when applying brakes. It is stiffened by a *hand-rail brace*.

Brake-hanger. 144, fig. 105; 86, figs. 1907-69; 7, figs. 236-49. A link or bar by which brake-beams and attachments are suspended from a truck-frame or car-body. It is attached to truck and car-body by a *brake-hanger carrier*. A *parallel brake-hanger*, which see, is used in passenger gear only, to cause the brake-beam to move out evenly parallel with itself. In the plan for freight-gear proposed by Mr. Westinghouse, figs. 249-51, the brake-hanger is rigidly attached to the brake-beam, being designed to have sufficient spring to enable the brakes to be put on or off.

2. (English.) 61, figs. 116. A wrought-iron bar by which the brake-block is suspended. No brake-beam is used.

Brake-hanger bracket (English). 62, figs. 116-117. American equivalent, *brake-hanger bearing*. A bearing for the brake-hanger, generally made of wrought iron.

Brake-hanger bearing. 14, figs. 245, 251, 236, 249. A casting which is held by a brake-hanger carrier, and which forms a bearing for a brake-hanger.

Brake-hanger carrier. 87, fig. 1969; 8, figs. 245, 251, 236, 249. An eye or U-bolt, a casting or other fastening by which a brake-hanger is attached to the truck or body of a car. See also *Parallel brake-hanger carrier*.

Brake-hanger timber. 6, figs. 88, 94, 91, 96, 106. A short transverse timber between the floor-timbers of a car-

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83, figs.
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83, 311; 96,
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Figs. 327-8.
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Brake-hose coupling-valve spring (Westinghouse brake).
6, figs. 327-8.

Brake-hose nipple (Westinghouse brake). Figs. 51-54.
A tubular elbow connecting the coupling-hose and the
brake-pipe.

Brake-lever. 92, figs. 1907-89; 11, figs. 236-51; 11, fig.
325, etc. A lever by which the power employed to apply
the brakes is transmitted to the *brake-beams*. The brake-
levers are connected to the brake-beams at or near the
short ends of the former, and the *brake-shaft connecting-*
rod, or some equivalent part, to the other end.

When only one brake-lever to a truck is used, as in
figs. 1961, etc., the pressure of the two brake-beams is
unequal. To obviate this two brake-levers are usually
used, as 11, figs. 236-49, which are further distinguished
as *dead-lever* and *live-lever*, figs. 338-348. The upper
end of the *dead-levers* is then attached to a *brake-lever*
stop or *dead-lever guide*. *Dead-levers* are also called
fixed brake-levers. See *Centre brake-lever*. *Floating lever*.

2. (English.) 87, figs. 116-119. A long bar attached
the *brake-shaft* in order to apply the brake to by hand.
See *Guard's van*.

Brake-lever bracket (hopper-bottomed coal cars). 148,
figs. 103-4. A wrought-iron knee on the under side of a

upper end of a brake-lever. Further distinguished as *live-lever* and *dead-lever* guides, the latter provided with pins for readjustment as the brake-shoes wear, and also called a *brake-lever stop*.

Brake-lever handle (English). 60, figs. 116-119. The handle at the end of the brake-lever.

Brake-lever jaw. Fig. 1747. A *Brake-lever fulcrum*, which see.

Brake-lever pintle (lever hand-car). 27, figs. 1724-6. See *Pintle*.

Brake-lever ratchet (English). 59, 116-119. Teeth cut in the *brake-lever guard* (which see), to prevent the brake coming off after being applied.

Brake-lever sheave (Elder brake-gear). Fig. 234; 96, figs. 1929, 1981. A pulley attached to a brake-lever, over which a chain by which the brakes are applied runs.

Brake-lever stop. 95, figs. 1945-64; 13, figs. 236, 249. An iron bar or loop attached to a truck or car frame, and which holds the upper end of a fixed or *dead* brake-lever. It usually has holes in it in which a fulcrum pin is inserted. By moving the pin from one hole to another the lever is adjusted so as to take up the wear of the brake-shoes. Also called *Dead-lever guide*.

Brake-mast. Fig. 1801. A *Brake-shaft*, which see.

Brake-pawl. 159, figs. 156, 170, 182, 241, 252-62. A small pivoted bar for engaging in the teeth of a *brake ratchet-wheel*, which see. It is placed in such a position as to be worked by the foot. The mode of attachment now considered the best is shown in figs. 252-62.

Brake-pawl carrier. 6, figs. 252-4, 264. See *Brake-pawl* and *Brake ratchet-wheel*.

Brake-pawl dog. 5, figs. 252-4, 259. A pivoted casting serving as a weight to throw up the *brake-pawl* so as to engage with the ratchet on the under side of the *brake ratchet-wheel*, which see, in the improved brake-gear shown in figs. 252-4.

Brake-pipe (Westinghouse automatic-brake). 16, figs. 325; 9, figs. 838-9; L, fig. 687. An iron pipe extending from one end of the car to the other under the car-body, and connected to the pipes on the adjoining cars by flexible *brake-hose*, serving to convey the air from the air-pump on the engine to the *auxiliary reservoirs* attached to the cars. These pipes are filled with compressed air when the brakes are not on. When the latter are to be applied, the air is allowed to escape from

the pipes, which causes the *triple-valves* to open communication between the *auxiliary reservoirs* and the *brake-cylinders*, so that the compressed air stored up in the reservoirs acts on the pistons and brake-levers.

Brake ratchet-wheel. 103, figs. 82-92; figs. 241, 258; 158, figs. 169-88, etc. A wheel attached to a brake-shaft having teeth shaped like a saw, into which a *pawl* engages, thus preventing the wheel and shaft from turning backward. An improved form of recent introduction. 7, figs. 252-4, is a ratchet-wheel with the ratchet upon the under side, instead of on the edge. The brake-pawl falls away of itself by gravity from the ratchet-wheel, except when the *brake-pawl dog*, 5, is thrown over so as to bear upon its outer end. In that case the brake-pawl is automatic in its action, without being adjusted by the foot of the brakeman. The brake-pawl is pivoted in the *brake-pawl carrier*, which latter is bolted to the roof of the car.

At the Thirteenth Annual M. C. B. Convention it was recommended that the practice of placing the ratchet-gear on a small platform or *brake-step* (100, figs. 83, 84, 89, etc.) be discontinued, and that they be fastened to a suitable casting on the roof.

[In most of the standard English dictionaries, as well as in Knight's "American Mechanical Dictionary," the term ratchet is defined as the dog or pawl which catches into the ratchet-wheel, as well as the ratchet-wheel itself. The same dictionaries, however, also give *pawl* as the name for the part serving this purpose, and it is believed that this is an error in definition, at least as respects American practice, which has been copied from one dictionary to another, and which does not correspond with the practice in mechanical work, in which the term "ratchet" is confined to the serrated edge, whether straight or on a wheel, into which the pawl engages, and does not designate the pawl itself as a ratchet.]

Brake ratchet gear, complete. Figs. 241, 252-62.

Brake-rod. Any rod serving to connect brake-levers, but especially the *lower brake-rod*, 97, figs. 1907-69, which see, and the *secondary brake-rod*, 6, figs. 227-35, which see. The *brake-shaft connecting-rod* is sometimes called the *main brake-rod*. The *long brake-rod*, 12, fig. 232, extends the entire length of the car in the Stevens brake-gear.

See *Lower brake-rod*. *Secondary brake-rod*.
Main brake-rod.

2. (English.) 56, figs. 116-119. A bar of iron connecting the *brake-shaft arms* to the brake-blocks.

Brake-rod guide. Any form of special support for a brake-rod.

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31, 1948; 10,
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69. A strap
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s figs. 82, 132,

2. (Creamer brake, which see.) 18, fig. 263.

Brake-shaft bushing (Miller coupler and platform). Figs. 636-43. A thimble on the brake-shaft.

Brake-shaft chain. 150, fig. 105; 3, figs. 237-35. A chain connecting the *brake-shaft* with the *brake-levers* through the *brake-shaft connecting-rods*, to the end of which it is attached. The force exerted on the shaft is transmitted by this chain. With the usual dimensions of shaft and chain, as now adopted, the tension obtained upon the brake-shaft chain is about 100 lbs. per inch in diameter of brake-wheel. See *Horizontal brake-shaft chain*.

Brake-shaft-chain sheave (Elder brake-gear). Fig. 234; 105, figs. 82, 84, 132, 136. A roller over which a brake-shaft chain passes.

Brake-shaft connecting-rod. 151, figs. 105, 108; 4, figs. 237-35; 9, fig. 325. A rod which is attached at one end to a *brake-chain*, and at the other to a *brake-lever*, or to the *centre-lever* of the Tanner or Elder brake, or to the *floating-lever* of the Hodge brake.

Brake-shaft crank (street cars). 120, figs. 1843, 1845. An elbow attached to the upper end of the brake-shaft, carrying a handle for turning the brake shaft and operating the brakes.

Brake-shaft crank-handle (street cars). 121, figs. 1843,

Brake-shaft-step brace. A wrought-iron brace to resist the pull of the brake-chain.

Brake-shaft thimble. 44, fig. 640. An iron bushing attached to some portion of the car to form a bearing for a brake-shaft.

Brake-shoe. Figs. 1977-81; 2, figs. 286-46; fig. 288. A piece of metal or wood shaped to fit the tread of a car-wheel and attached by a key or otherwise to a *brake-block* or *brake-head*. The latter term, however, is more properly a combined brake-shoe and brake-block in one solid casting. The brake-shoe rubs against the tread of the wheel when the brakes are applied. Such shoes are made of cast, wrought, or malleable iron, usually cast iron. The *Congdon brake-shoe*, fig. 289, is of cast iron, with loose scraps of wrought iron or steel cast in it, greatly increasing its durability and, it is claimed, improving or not injuring its holding power. English brake-shoes (*brake-blocks*), 63, fig. 116, are of wood.

See *Standard brake-shoe*. *Christie brake-shoe*.
Fowler brake-shoe. *Reversible-hook brake-shoe*.
Banning brake-shoe. *Ross brake-shoe*.

2. ("American" steam driver-brake.) 27, figs. 263-5.

3. (Westinghouse driving-wheel brake.) 16, fig. 322.

Brake-shoe hanger ("American" bell-crank steam driver-brake). 15, figs. 363-5. In the Westinghouse brake called the *suspending-link*.

Brake-shoe key. Fig. 283. A key or wedge by which a *brake-shoe* is fastened to a *brake-block*.

Brake-spool. Fig. 1743. Also called *brake-shaft drum*. An enlargement by a sleeve or otherwise of a brake-shaft to give greater speed and less power to the brake-gear. A *Brake-chain worm*, which see, is a somewhat similar device.

Brake-spool step (logging cars). Fig. 1800. A U-shaped strap inclosing the brake-spool and equivalent to a *Brake-step*, which see.

Brake-spring. A *Release-spring*, which see.

Brake-staff. A *Brake-shaft*, which see.

Brake-step. 100, figs. 82-92, 132-4. A small shelf or ledge on the end of a freight-car near the top, on which the brakeman stands when applying the brake from the top of a car. Also called a *brake foot-board*. A *brake-step* should not be confounded with a *brake-shaft step*, which see, which is a bearing for the lower end of a brake-shaft.

The use of brake-steps has been condemned by the Master Car-Builders' Association, which recommended (Chicago, 1879), "That the small platform (*brake-step*) placed at one end of freight cars, to fasten the brake-pawl, etc., be discontinued, the ratchet-wheel and pawl to be fastened to a suitable casting on the roof." See fig. 657.

Brake-step bracket. 101, figs. 82-92, 132-4. An iron bracket to support a brake-step.

Brake-treadle (hand-cars). 4, fig. 1724-6. A lever for applying brakes with the foot.

Brake-valve (of air or steam brakes). The valve operated by the engineman to apply brakes. See *Engineer's brake-valve* (Westinghouse), figs. 311, 334. *Steam brake-valve* (American), figs. 360-2.

Brake van (English). American equivalent, *cabooses* or *baggage car*. A covered vehicle in which the conductor (guard) of a train travels, and which is fitted with a powerful screw hand-brake. On passenger trains it carries the passengers' baggage (luggage), express matter (parcels), and dogs, etc. On freight (goods) trains it is weighted with pig-iron, and is primarily used as a source of brake power. Also called *guard's van*.

Brake-windlass. A term sometimes used to designate the *brake-shaft*, which see, with all its attached parts.

Brake-wheel. 93, figs. 82-143; 157, figs. 155-88; fig. 257, etc. A hand-wheel attached to brake-shaft, and by which the latter is turned. Sometimes on coal cars and elsewhere a mere bent rod is used, as in fig. 109.

Brass. "An alloy of copper and zinc. The term is commonly applied to the yellow alloy of copper with about half its weight of zinc, in which case it is called by engineers *yellow-brass*; but copper alloyed with about one-ninth its weight of tin is the metal of brass ordnance or gun-metal. Similar alloys used for the '*brasses*' or bearings of machinery are called *hard brass*, and when employed for statues and medals they are called *bronze*." —*Toml. Cycl. Useful Arts*.

According to present usage, alloys of copper and tin, or of copper, tin and zinc, are termed *bronzes*, which see. Railroad *journal-bearings*, which see, are often termed *brasses*, but are generally bronzes.

Bridge. In car construction the term *bridge* means a timber, bar or beam which is supported at each end. See *Bolster-bridge*. *Centre-bearing bridge*. *Side-bearing bridge*.

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See *Argand-*

See *Seat-*

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st universal
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auge. *Stan-*

Buffer. An elastic apparatus or cushion attached to the end of a car to receive the concussions of other cars running against it. The term is generally applied to those attachments in which springs are used to give the apparatus elasticity. The term is often applied to a *Drawbar*, which see.

2. (Cowell platform and coupler.) 1, fig. 538. The *Platform-plate*, which see.

3. (Janney coupler.) 4 and 5, figs. 542-54; 29', fig. 188. The bars projecting beyond the platform in passenger cars and beyond the end-sills in freight cars, to transmit the shock of coupling to springs with which they connect. They are two in number in the Janney coupler, but only one, directly above the drawbar hook, in the Miller. The Janney buffer is made in two styles, round-face and (more recently) flat-face.

4. (Miller coupler.) 35, figs. 636-40. See above.

Buffer-arm. A *Drawbar timber*, which see.

Buffer-bar. A wrought-iron bar at the end of a car, carrying a *Buffer*, which see. In this country they are used chiefly with the Miller and Janney platforms.

Buffer-beam. 1. (Freight cars.) 32', fig. 106. A transverse timber bolted to the outside of an end-sill of a car

Buffer-block face-plate. A metal plate bolted to the face

of a wooden buffer-block to protect the wood from wear.

Buffer-cushion (Cowell coupler). 23, fig. 538. A semi-circular rubber pad, placed inside the supplemental platform and coming between it and the platform end-timber of the next car, to prevent the platform or buffer-springs from being overloaded.

Buffer-guide (Janney coupler.) 30, figs. 542-554, 555-601. The malleable iron sleeve carrying the Janney buffer-shank through the platform end-timber.

2. (Janney-Miller coupler). 29, figs. 542-554, 555-601. The malleable iron sleeve carrying the Miller buffer-shank through the platform end-timber.

Buffer-head. 35, figs. 636-41, etc. A broad, flat end of a buffer in Miller, Janney, or English draw-gear. In English cars they are about 12 in. in diameter, in American much less. See *Buffer*.

2. (English.) 47, figs. 116-117 and 205-206. See above. Equivalent, *side buffer*.

Buffer-plate (Miller platform). 3, figs. 638, 640. An iron plate with which the buffer-beam is faced, and through which the buffer-shank passes.

Buffer-rod (English). 48, figs. 116-119 and 204-207. A rod which transmits buffing strains from the *buffer-head* to the *buffer-spring*.

Buffer-rod guide, or buffer-block (English). 49, figs. 116, 117, 118 and 205-207. A casting bolted to the outer side of the *end-sill* or *head-stock*.

Buffer-rod shoe (English). 50, figs. 117 and 206. A casting keyed to the end of the *buffer-rod* which bears on the *buffing-spring*.

Buffer safety-lug. 21, figs. 883, etc. A projecting horn sometimes cast on top of freight drawbars to bear against a buffer-block and relieve the draw-gear from excessive compressive strains. It is not in general use.

Buffer-shank (Miller buffer). 36, fig. 639. The square part between the buffer-head and buffer-stem.

Buffer-spring (Cowell coupler). 14, fig. 538. Two springs bearing against the rock-lever, serving the purpose which their name implies, and assisted in cases of severe impact by the rubber buffer-cushion 23.

2. (Freight cars.) Figs. 2058-5. A synonymous term for *draw-spring*, there not being usually separate springs for buffing and draft strains. *Draw-spring* is the preferred term, although both are much used.

3. (Hoit draw-gear.) 4, figs. 426-7. A spring sustaining buffing strains only, and abutting against a cross-piece termed the *follower-plate block*, which latter is stiffened against buffing strains by the *double-spring draw-bar timbers*.

4. (Janney coupler.) 26, figs. 542-554, 555-601. More properly *centre buffer-spring*, against which the *equalizer* bears connecting the two buffers.

5. (Miller coupler.) 5, figs. 636-8.

Buffer-spring bed (English). 8, figs. 116, 117 and 205, 206. Serves the purpose of the American *draw-timber*. A timber in the centre of the under frame which receives the thrust of the buffing-spring.

Buffer-spring beam (Miller coupler). 24, figs. 636-8. A short transverse timber framed between the draw-timbers, against which the buffer-spring bears.

Buffer-spring cup (Miller coupler). 6, figs. 636-8. An iron seat in which the inside end of the buffer-spring rests, when a volute spring; when a spiral spring, the spring-cup is the same as the *buffer-spring washer*.

Buffer-spring washer (Miller coupler). 7, figs. 636-8. See *Buffer-spring cup*.

Buffer-stem (Miller buffer-bar). 37, fig. 639. The round part which passes through the buffer-springs.

Buffer-stem washer (Miller coupler). 8, figs. 637-8. The bearing for the key in the end of the buffer-bar.

Buffer-thimble (Miller coupler). 9, fig. 638. A cast-iron bushing in the platform end-timber. The buffer-thimble and buffer-plate are now made in one piece.

Buffer-washer (Janney). 38, figs. 542-554, 555-601. A malleable iron washer with square hole used on inner end of Janney buffer.

Buffet (boo-fäy', Fr.). Figs. 213, 679, etc. A side-board. Hence—

Buffet-car (boo-fäy'-car). A term (meaning, literally, *side-board-car*) applied to a style of sleeping-car of late introduction, the novelty in which consists in the addition of an ornamental buffet with plate-glass front at one end of the car where light lunches can be prepared for the passengers. *Buffet smoking-cars* are also built in the same general style of finish.

Buffing and draw spring (English). See *Plate buffing and draw-spring*.

Bullion-van (English). A covered vehicle adapted to run on passenger trains for the conveyance of specially valu-

See *Signal-lamp*.
term used to designate a *Buffer* or
lock, which see.
r-block, which see.
of sleeping berth permanently
a car.
g. 1808. A cross-piece similar to a
limber is loaded.
s). Fig. 1789. An iron strap to

also termed *Reversible seats*,
combining the seat and seat-
whole seat reversing by swing-
and seat-back downwards, so
comes the back, and *vice versa*,
back only over in the usual man-

on the Baltimore & Ohio Rail-
cars.

nal-lantern. Figs. 972-3. A
ich the lamp is fixed to the
as globes of different colors are
ing around the lamp so that by
be changed from red to white
le of accomplishing the same
e *inspector's lantern*, fig. 960,
used to interpose between the
s. The advantage claimed in
that the change is more easily
that the lower globe, which is
use to elevate the blaze when
ground

See *Bell-cord bushing*, figs.
702-3.

*Berth-curtain-rod bush-
ing*.

Berth-hinge bushing.

Brake-shaft bushing.

Deck-sash pivot bushing.

Head-board bushing.

*Lower steam-valve bush-
ing*.

2. (Pipe-fitting, which see.) Fi
tube with a screw cut inside and c
into a pipe to reduce its diameter.
has a hexagonal head by which it
times called *reducer*.

Bushnell seat-cushion. Fig. 1206.
ented by E. L. Bushnell, of Poug
Seat-cushion.

Butt. A contraction of *Butt-hinge*,
ally used as a substitute for the lor

Butt-hinge. A hinge for hanging
fastened with screws to the edg
when the latter is closed the hinge
the door and its frame. A hinge
in fig. 779, the two parts of which
gether that they cannot readily be
fast-joint butt-hinge. Other forms
hinge, fig. 780, and *loose-pin butt-hi*
best butt-hinges, as in fig. 789, the
hinge-pin screwing into the knuckle
a washer. The hinge-pin is often
acorn, and those having a washer

Door-case-sash button.
Eccentric window button.
L-window button.
Pull-rod button.

Solid-leather button.
V-window button.
Wheel-box button.
Window-button.

C

Cabin (pile-driver car). Figs. 1821-4. A small house for the engine and hoisting-gear, usually built on the *swing-ing-platform*.

Cabin-car. A term sometimes applied to *Caboose cars*, which see; more particularly four-wheeled caboose cars.

Cabin-scantling (pile-driver car). 30, figs. 1821-4. See *Scantling*.

Cabin-shutter (pile-driver car). 13, figs. 1821-4.

Caboose-car. Figs. 44-7. A car attached to the rear of all freight trains for the accommodation of the conductor and train-men, and for carrying the various stores, tools, etc., required on freight trains. Also, but rarely, called *conductor's car* or *train car*. Caboosees are often made with a *lookout* for displaying train signals to the locomotive and following trains, and to give the train-men a view of the train. They are in increasing use, but the majority of caboose cars as yet do not have them. Caboose cars are either *four-wheel* or *eight-wheel*, the latter being by far the most common, but the Pennsylvania Railroad and other lines use four-wheeled cabooses, usually termed *cabin cars*. A trap-door is sometimes placed in the platform, as in fig. 108, to serve the purpose of a water-closet.

Cage. 116, figs. 189, 142. See *Tank-valve cage*.

Camber. The upward deflection or bend of a beam, girder or truss. Freight cars are usually heavily cambered when new by screwing up the body truss-rods. Passenger cars have little or no camber.

Candle. A special kind of large diameter called *car-candles* are used for lighting passenger cars and burned in *Candle-lamps*, which see. Since the introduction of high-proof mineral oils they are now rarely used. The best car-candles are made of paraffine and *hydraulic-pressed*.

Candle-bottom. Fig. 908. See *Candle-lamp*.

Candle-holder. Fig. 904. See *Candle-lamp*.

Candle-holder cap. 21, fig. 904. See *Candle-lamp*.

Candle-holder cup. 22, fig. 904. See *Candle-lamp*.

Candle-lamp. Figs. 838, 846, 908-4. A lamp for burning candles, sometimes elaborated into a *chandelier* with two or three burners. Candles, however, are now but little used. The candle is placed within a *candle-holder*, fig. 904, carried within a *candle-bottom*, fig. 908. The candle-holder consists of a *candle-holder cup* and *candle-holder cap* connected by the *candle-rods*, fig. 904, and having a light spiral *candle-spring* within. As the candle burns away it is pressed upward by the candle-spring against the cap so as to keep the flame always in one position.

Candle-rods. 23, fig. 904. See *Candle-lamp*.

Candle-spring. 24, fig. 904. See *Candle-lamp*.

Calaminated iron. See *Kalaminated iron*.

California truck. See *Allen truck*.

Callender lamp-burner. Fig. 901. One of the no-chimney burners.

Cam (Yale lock). Figs. 1027-8. The revolving disk, usually of a spirally eccentric or heart-shape, fixed on the outside of the shaft which carries the *tumblers*.

Cane-seat. Figs. 1157, 1166, 1211, etc. A seat made of woven strips of cane or rattan. For additional strength it is now often *canvas-lined*, the cane seating then coming in rolls. The cane, or rattan, is woven close and cemented to the canvas.

Cannon-car. A car especially constructed for carrying heavy cannon. Also called *gun-car*.

Canopy. Figs. 940-1. See *Lamp-canopy*. Also called a *Smoke-bell*, which see. A platform-hood is sometimes called a *canopy*.

Canopy, or smoke-bell (Harrison postal-car chandelier)-A, figs. 841-2.

Can't-rail (English). 98, figs. 204-207. American equivalent, *plate*. A horizontal timber running along the top of the upright pieces in the sides of the body, and supporting the roof and *roof-sticks*. Its upper edge is cut to the bevel of the roof; hence its name.

Cap-screw wrench (Westinghouse brake). 49, fig. 811.

Canvas. A coarse cloth made of cotton, used for outside covering of street-car roofs and for upholstering seats. *Roofing-canvas* is used for covering street-cars.

Canvas-lined seating. Fig. 1218. See *Cane-seat*.

Cap. The top or covering of anything.

triple-valve.
under cap.
ice cap.
er cap.
cap.
cap.

cap.
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cap.
triple-valve.
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Caboose car, or cabin car
(sometimes called con-
ductor's or train car).
Cannon car.
Coal car.
Coal dump car.
Double-deck car.
Drop-bottom car.
Dump car.
Flat car.
Folding-side gondola car.
Furniture car.
Gondola car.
Grain car.

Heater car.
Hopper-bottom car.
Ice car.
Iron-hopper coal car.
Lumber car.
Milk car.
Mine car.
Oil, or tank car.
Ore car.
Pay car.
Refrigerator car.
Stock car.
Tip car.

Among working cars are :

Block car.
Boarding car.
Derrick car.
Ferry push-car.

Inspection car.
Sweeping car.
Tool car.
Wrecking car.

Freight cars are also generally designated as *four-wheel* or *eight-wheel*, the latter carried on two trucks of four wheels each, and including an immense majority of American rolling-stock. *Iron cars* having the sills, etc., of iron are also constructed, and also *tubular cars*, which use iron gas-pipe for framing.

Car-axle. Figs 1974-5. M. C. B. Standard. Also 2. figs.

Cowell, Janney, Miller and Blackstone couplers, which see, figs. 587-648. *Automatic freight-car couplers*, which see, figs. 409-28, are not yet in general use. The M. C. B. Association has taken action in respect to them, favoring those of the same general type as the passenger car couplers.

Car-cylinder (Westinghouse brake). Figs. 303-9, 329-31. One of the three kinds of *brake-cylinders*. Each kind is made of several different patterns or sizes.

Car-door hangers. Figs. 871-2, 791-801. A device for hanging a sliding door so that it may be movable. In common practice the simple hooks upon which most freight-car doors are hung are termed simply *Door-hangers*, which see, while more elaborate forms with rollers have their name expanded into *car-door hangers*.

Car-door hangers termed anti-friction are of three types, in one of which, figs. 794-4, there are a series of loose rollers passing in rotation over the bearing surface; in the second, figs. 791, 798, 796, the door carries a slotted plate, which rests upon the pivot of a large wheel which rolls upon the track; the third class, figs. 798-801, are of the "grindstone-bearing" type, the journal of the bearing-wheel proper resting upon other wheels.

Car-door lock. Figs. 987, 1005-21. A lock for a car-door, usually meaning for a passenger-car door. See *Freight-car lock*.

Card-rack. Figs. 1048-9; 80, fig. 98. A small receptacle on the outside of a freight-car to receive cards giving shipping directions.

Car drain-cup (Westinghouse automatic brake). Fig. 298; 27, fig. 811. An attachment to the brake-pipe of every car to collect the water of condensation, which is drawn off from time to time by a cock at the bottom.

Car-furnishings. Figs. 696-1707. The hardware, upholstery materials and other fittings, such as lamps, ventilators, water-coolers, etc., used in finishing a passenger-car. Stoves and heaters would hardly be called furnishings in general practice, but are so classified for convenience.

Car-heater. Figs. 1800-1587. Any apparatus for heating cars by convection, that is, by conveying hot water, steam, or warmed air into, or through, the car. It generally refers to any arrangement for warming cars, other than stoves. See *Baker, Bissell, Gouge, Johnson, Searle,*

Spear, suspended and Winslow heaters. See also *Stove, Cook-stove, Range, etc.*

Carline, or carling. 81, figs. 84-188; 100, figs. 158-178; 53, figs. 1848-4. A transverse bar of wood or iron which extends across the top of a car or from one side to the other, and which supports the roof-boards. In passenger cars carlines are divided into *main carlines*, passing entirely across the car; *short carlines* or *deck carlines*, which are confined to the upper-deck, and *rafters*. 16, fig. 186, which are confined to the lower deck. The carlines of freight cars are also rarely called rafters. The main carlines are usually *compound*, fig. 647, i. e., built up of wood and iron. They sometimes pass directly from side to side of the car across and under the upper-deck, when they are termed *continuous* or *straight* carlines, but usually are bent to the outline of the clear-story, when they are termed *profile* carlines. In freight cars the *main carline* is one made stronger than the others for carrying the purlins and roof. Other carlines having special names, which see, are

End carline. *Platform-roof carline.*
Platform-hood car- *Platform-roof-end carline.*
line.

Carlton & Stroudley fastening (steel-tired wheels). Fig. 2156. See *Tire fastening*.

Car-mouldings. Figs. 1050-64. See *Mouldings*. See also *Car-seat mouldings*, figs. 1199-1204, which latter are metal bands for seat-backs.

Car-perch (tip cars). 26, fig. 143. Another name for *draw-timbers*; derived from the *perch* of wagons, which is the pole connecting the front and hind gear of a spring carriage. The term car-perch is usually applied to the draw-timbers only when iron channel-bars are used in the place of wood. A patented form is the *Richards car-perch*, not illustrated.

Carpet eyelet. Figs. 802-5. See *Eyelet*.

Carpet-knob. Fig. 805. An *Eyelet-nail*, which see.

Car-platform. 34, figs. 155-183; 104, figs. 1848-4. More commonly, simply *Platform*, which see.

Car-pump. A *Basin pump*, which see.

Carriage, or railway carriage (English). Figs. 204-207. American equivalent, *passenger car*, or *coach*. A vehicle for passengers, having four, six, eight or twelve wheels (usually six wheels). It is divided into compartments by *partitions*. A *first-class* compartment seats six or

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hanger

supported

also *Board-roof*, and the various kinds above specified.
In respect to form, see *Arched roof, deck, A car-roof*,
and *X car-roof*. Figs. 649-50.

Carry-iron.

See *Drawbar carry-iron*. *Inner drawbar carry-iron*.
Draw-timber carry-iron.

2. (Cowell platform and coupler.) 9, fig. 540. More
properly *Stirrup*, which see.

Car-seal. Figs. 1110-19, 1011-18. A device to secure
freight-car doors against opening by making it impossible
without destroying the seal. The original form consisted
of a lead disk with two holes to receive a piece of twisted
wire, which is compressed by a die so as to leave a seal-
mark which must be defaced or the wire cut before the
door can be opened. To prevent stripping the seal from
the wire and re-inserting it, a detective wire of irregular
cross-section is used, fig. 1117. Sheet-metal *eyelet-*
shackles in a variety of other forms are now also used,
with or without tin *return-tags*, and also a simple lead
rivet with a tin shackle. Tin shackles often have the
name of the road printed on them.

Car-seat. Figs. 1120-1204 ; 122, figs. 155-85, 1120-23 ; also
1123-60. The complete set of fixtures on which passen-
ers sit in a car. It ordinarily consists of a *seat frame*

longitudinally on each side of the car, as shown in figs. 1848-4, extending its full length, and the passengers sit facing each other.

See *Cane-seat*.

Mason rocker-seat.

Perforated-veneer seat.

Rattan car-seat.

Side-seat.

Woven-wire seat.

Car-seat mouldings. Figs. 1199-1204. Metal bands, usually nickel-plated, used to finish seat-backs. They are either *plain* or *beaded*. See *Mouldings*.

Car-signal valve (Westinghouse train signaling app's, which see). Fig. 688. A valve placed in every car and attached to the bell-cord or signal-cord, by which air is allowed to escape from the *signal-pipe*, thus blowing the *signal-whistle* on the engine.

Car-spring. Figs. 2081-2106. See *Spring*. *Spiral spring*. *Elliptic spring*. *Bolster-spring*. A general term applied to springs on which the weight of a car rests, and also to draw and buffer springs.

Car-steps. Figs. 686, etc. See *Platform steps*.

Car-truck. Figs. 1907-69. Mechanically, a small low four-wheeled (or sometimes six-wheeled) car, carrying as a dead load one-half the weight of a long car-body by means of a pair of *centre-plates* (truck centre-plate and car-body centre-plate), with a *centre-pin* or *king-bolt* passing through them, about which the truck or, more properly speaking, the car-body, can swivel. In England such trucks are called "bogies." See *Truck*.

Carving-table (dining cars). Fig. 193, etc.

Car-washer. Fig. 1879. A brush made for washing the outside of passenger cars. They are made of bristles or feathers.

Car-wheel. Figs. 2124-80; 1, figs. 1907-67; 25, fig. 2002. A wheel for a railroad car. Such wheels are usually made in this country of cast-iron with a *chilled* tread and flange, but a great and increasing proportion of passenger wheels are *Steel-tired*, which see. Chilled-wheels are called *single-plate wheels* or *double-plate wheels*, according to the number of cast plates connecting the hub and tread. When one plate is used, it is sometimes made flat, with ribs called *brackets* on the back, and sometimes *corrugated*, without ribs. The disks of double-plate wheels also are generally corrugated. What is known as the *Washburn* wheel has two corrugated disks extending from the hub about half way to the tread, and a single plate, with curved brackets on the back, between

the tread and the double plates. Cast-iron wheels are also made with spokes, either solid or hollow, principally for locomotive use.

An average weight of standard 38-inch wheels is 535 lbs. The approximate standard section of tread in the best modern practice is shown in fig. 2150.

The standard diameter of car-wheels may be said to be 38 in., but the Baltimore & Ohio and some other lines used until recently 80 and 81-in. wheels, and wheels as small as 28 in., and even less, are used for locomotive trucks. Forty-two-inch wheels are now becoming very common in passenger service, occasionally chilled cast-iron wheels, but usually steel-tired, which see. In England passenger wheels vary from 42 to 48 in. in diameter, and freight-car wheels are always 36 in. Both have always steel or wrought-iron tires.

Prices of wheels and axles and cost of work on same has been fixed at various rates by the rules for interchange of cars of the M. C. B. Association, as follows:

	1883-4.	1892.	1879 to
One new 36-inch wheel (less defective) on same axle	\$11.00	\$12.00	
Two " " " " " " " "	21.00	23.00	
One " 28 " " " " " " "	8.00	9.00	
" " " " (less second-hand) " " "	6.00	.....
Two " " " " (less defective) " " "	16.00	17.00	
" " " " (less second-hand) " " "	12.00	.....
One new axle-turned and fitted (less defective).....	8.00	8.00	
" " " " (less second-hand).....	4.00	.....
Second-hand wheels (less defective), per wheel or per pair.....	2.00	2.00	
Loose wheels refitted on second-hand axle, per wheel or per pair.....	2.00	2.00	

The parts of wheels are the *flange*, *tread*, *rim*, *face of rim*, *tire*, *retaining-rings*, *plate*, *ribs*, *spokes*, *centre*, *hub* and *axle-seat*.

The varieties of cast-iron wheels beside the single-plate, double-plate and Washburn, above mentioned, are the *broad-tread* or *compromise wheel*, *combination plate-wheel*, *combination wheel*, *hollow-spoke wheel*, *open-plate wheel*, *spoke-wheel*, *Hamilton steeled wheel*, *Thatcher corrugated wheel*. The *Saxe & Kear wheel* is a wheel cast on to an iron or steel tire. *Cast-steel wheels* have been made, but can hardly be said to be in use. See *Steel-tired wheel* and any of the above.

Car-window blind (Wilson's flexible, which see). Figs. 1645-7. See also *Window-blind*.

Car-window brush. Fig. 1879.

Cass. "A covering, box, or sheath; that which incloses

noier spring padlock.) 8, fig. 1031.
heaters.)

pipe casing.
casing.
casing.

*Perforated smoke-pipe
casing.
Smoke-pipe casing.*

heater.) 16, figs. 1486-9; fig. 1523. A
st-iron cover by which the fire-pot is
leave an air-space between the two.
outside) (suspended heater.) B and C,

ws.) 7, figs. 679-81, 682-5. The frame
a window. See *Window-casing*.
all heater). Figs. 1355, 1381.

ing-cars). Fig. 1540-5; and fig. 214. A
holding bottles of condiments.

heater). Fig. 1408+. The part to
the feed-door (12), draft doors (23
r (31) and grate-slide (34). It is fast-
if case (87).

lounge heater). Fig. 1384. A U-shaped
ast front to the case.
of metal which has been cast in a

ig. *Roller side-bearing cast-
ing.*
e-cast- *Roof corner-casting.*

r cast- *Side-casting.*
Transom-casting.

. 1479. A common form of cheap
stood to be of an egg-shaped form ap-
to fig. 1479, and used for cab-
ies when

not such, not having
fig. 1545, *table-caster*
casters, table-casters,
and probable use.

Cast wheels. Figs. 2
wheel.

Catch. See *Cupboard-
Deck-sash catch*
Door-holder catc

2. (Janney coupler.)

which engages with ti
secures it in position w/
Catch-lever (Janney cou

A crank-lever passing
means of which it is c/
uncoupling.

Catch-spring (Janney co
601. A coiled spring on
the catch.

Catch-spring bolt (Janne
555-601. The bolt on whi
slides.

Cattle-car. Figs. 5-7, 33, 34
car, which see.

Cattle-wagon (English).

wheeled stock-car. A four
freight service, and adapte

The floor boards are laid i
age, and are covered with
slipping.

Ceiling. The inside

cloth head-lining is also sometimes put on in panels. *Deafening ceiling*, which see, is boarding under the sills of the car, making an air-space between the sills.

Ceiling-veneers. Thin boards with which the ceilings of passenger-cars are covered.

Central filling-piece (steel-tired wheels). Figs. 2163-4, etc. The part surrounding the hub and connecting it with the tire. Also termed the *skeleton*. A *wheel-centre* is a hub and central filling-piece combined in one.

Centre-bearing. Figs. 215-25, etc., etc. The place in the centre of a truck where the weight of a car-body rests. A *body centre-plate* attached to the car-body here rests on a *truck centre-plate* attached to the truck. The general term *centre-bearing* is used to designate the whole arrangement and the functions which it performs in distinction from *side-bearing*, which see.

Centre-bearing arch-bar. 68, figs. 1969-70. See *Centre-bearing bridge*.

Centre-bearing beam. B₁, fig. 1971; 65, figs. 1969-70. See below.

Centre-bearing bridge (six-wheel trucks). 66-7, figs. 1969-70. A longitudinal iron beam, formerly sometimes a wooden beam, the ends of which rest upon the *spring-beams* and by which the *truck centre-bearing beam*, 65, carrying the *centre-plates*, is supported. It consists of the *centre bearing arch-bar* and *inverted arch-bar*, inclosing between them the *centre-bearing beam*. *Truck side-bearings* similar in form to an arch-bar are also attached to the extremities of the *spring-beams*, connecting them together.

Centre-bearing inverted arch-bar. 67, figs. 1969-70; B₁, fig. 1971-3. See above.

Centre-block. A *Centre-plate block*, which see.

Centre body truss-rods. Those nearest the centre, when two or more body truss-rods are used under each side of a car-body.

Centre brake-lever (Tyler, Elder and Tanner brakes). 9, figs. 229, 233, 234; 129, figs. 1843-6. A horizontal lever placed underneath the bottom of a car-body, and attached by a fixed fulcrum in the centre of the body and of the lever. It is connected to each of the brake-beams by *secondary brake-rods* attached near to the fulcrum, and to the brake-shaft on each platform by a *brake-shaft connecting-rod*.

Centre brake-lever chain (Elder brake). 10, fig. 234. A

chain which runs over the *centre brake-lever sheaves*, on the centre brake-lever.

Centre brake-lever sheave (Elder brake). 11, fig. 234. See above.

Centre brake-lever spider. 130, figs. 1843, 1846. A wrought-iron support, resembling the letter H, for the centre brake-lever.

Centre-buffer follower-guide (Janney-Miller coupler). 100, figs. 542-554, 602-35. The guides, bolted to the inside of the main knees, upon which rests the centre buffer-spring follower.

Centre buffer-spring (Janney coupler). 26, figs. 542-554, 555-601. A spiral spring situated above the two draft springs, intended for buffing purposes only.

Centre buffer-yoke (Janney-Miller coupler). 44, figs. 542-554, 555-601. The yoke connecting the central Miller buffer with the Janney equalizer.

Centre counterbrace. 165, fig. 159. A counterbrace in the body of the car between the trucks, to stiffen a compression-beam brace. See *Counterbrace*.

Centre cross-bar (English). See *Brake-shaft cross-bearer*.

Centre door-hinge and stop (English). 179, fig. 205. The centre of three brass hinges securing the door to the body. The insertion of two rubber plugs into striking pieces on side wings on the hinge constitute Cross' patent stop, which is used to prevent the door striking the outside of the body when thrown violently open. See also *Seat-rail support*.

Centre door-rail. See *Middle door-rail*.

Centre-draft drawbar. 32, figs. 161-3. A drawbar which is connected directly with the king-bolt of a truck. It is a style specially designed for use on the very sharp curves (of 90 and 100 ft. radius) of the New York Elevated railroads, and at present confined to those lines.

Centre draft-tube (Argand lamp). a, figs. 849-50. The hollow passage for air in the centre of the burner.

Centre draw-rods (Hoit double-spring draw-gear). 6, figs. 426-7. Two rods tying together the needle-beams or cross-frame tie-timber, and serving to make the draw-rods continuous. Also called *cross-frame tie-rods*.

Centre floor-timber. 4, figs. 82-183. The *Centre-sills*, which see.

Centre-girth. 178, figs. 93-6. See *Door-centre girth*.

Centering-gauge (M. C. B. standard which see). Fig. 2114. A gauge to fix the middle point of an axle.

steam-cylinder, and the upper

9, figs. 215-17, etc.; 18, figs. which passes through the center and truck-bolster. The . It normally has no strain at the lower end. It is there-bolt in the usual sense, but in in is sometimes provided with d car-body firmly together, as e king-bolt is derived from the ; part for the front wheels of a ever, is the more common

107-9. One of a pair of plates, which support a car-body on here are two, the *body centre-plate*, which are sometimes 1 *female* centre-plates. The ich see, passes through them strain except in emergencies. *centre-plate*.

figs. 1918-29, 1956-67. A piece uck centre-plate to raise it up

al-car chandelier, F, figs. centre of the *centre-stay*, car-isks.

1 cars). 129, figs. 105-8, etc. e.

155-185, etc. The two main

Centre-stop (tip-car). 161, fig. 148. attached to a draw-timber to rest moving longitudinally.

Chafing-plate. A metal plate to resist beams, truck-transoms, swinging

See *Brake-beam chafing-plate*. *Drawt Trans*

Check-chain chafing-plate. *Truck Coupl*

2. (Janney coupler.) 109, figs. 5 the top of the stirrup.

3. (Janney-Miller coupler.) 50, 1 See above.

Chain. "A series of links or rings con one another, usually made of s*teel* Webster.

See *Basin-chain*. *Hoisti*

Berth-chain. *Horise*

Brake safety-chain. *chai*

Brake-shaft chain. *Lock-c*

Centre brake-lever chain. *Man-h*

Check-chain. *Pitch-c*

Connecting-chain. *Platfo*

Coupling-chain. *Railin*

Coupling-pin chain. *Safety*

Door-pin chain. *Tank-n*

Driving-chain. *Uncou*

Drop-bottom chain. *Wedge*

Chain and eye (for door-bolt, postal 1088.

Chain coupling-link. 1, fig. 440. Tv links attached together like a chain

which see, provided with screw-thread and nut for passing through the marble slab.

Chain-lock (for glass seals). Fig. 1016. One of the simplest forms of seal locks, relying solely for security on the protection of the seal.

Chain-plate (Gouge heater). 89, fig. 1412. A plate for attaching the chain which controls the injector-valve.

Chair. Figs. 1154-86. The usual designation for the seats of parlor cars. See *Revolving-chair*. *Hartley chair*. *Horton chair*.

Chair-arm plate. Fig. 1125. A metal plate for the top of a chair-arm. If for common passenger-car seats it is called an *Arm-cap*, which see.

Chair-back (Hartley chair). 9, figs. 1154-8.

Chair-car. Figs. 53, 159-60. Another name for *parlor* or *drawing-room* cars, which see, fitted with arm-chairs, which are usually adjustable arm-chairs, like the *Hartley* or *Horton*, which see, when this distinctive name is used.

Chair-caster. Fig. 1147. See *Caster*.

Chair-leg caster, or socket. Figs. 1145, 1148, 1545. A hollow casting which fits on the end of a chair-leg. Such casters, when casters proper, are provided with wheels, but frequently in car construction they are without wheels, and are then by custom of the trade still called *casters* (*fixed* or *rigid casters*), although properly not such.

Challender truss. Fig. 185b. A substitute for the truss-plank and side body-brace of passenger-car frames. It consists of a thin plate of iron with a 2 × 2 in. angle iron riveted to the top and bottom. It is fastened to each post by large wood screws, and is bolted to the side-sills. It serves also as a substitute for truss-rods under the car, and forms a part of the inside finish under the window. Cars trussed in this way are said to be as light and cheap as those in which the ordinary form of construction is used, with the advantage that they are more easily repaired, as the posts are not cut into. Two trusses in a car 64 feet long weigh about 1,600 lbs., and cost (in 1884) about \$90 to put in the car.

Chamber. See *Dust-guard chamber*. *Fire chamber*.

Chamber-cap (Westinghouse brake). See *Right chamber-cap*.

"Champion" lamp-burner. Fig. 899. One of the no-chimney burners.

Chandelier. Figs. 834-50. A centre-lamp having two or more burners, but generally meaning only those of very elaborate form or having more than two burners, as the four-light *postal-car chandelier*, figs. 840-2, which see.

2. (Pintsch gas apparatus, which see.) Fig. 827.

Channel bar. A, fig. 148; 25, fig. 1821. A general term applied by makers to iron rolled with the following section: [They are usually used for the side-sills of iron-frame cars, I-bars, which see, being used for the inside sills.

Chaplet. A piece of iron used in a mould for casting, to hold a core in its place.

Chase refrigerator car. An ice and salt car. In each end of the car are placed five cylinders, seven feet high by sixteen inches diameter. In the centre of each cylinder is a pipe larger at the top than at the bottom. The cylinders are filled from the roof with broken ice. Drainage is had by a valve at the bottom of the cylinders operated by a rod running to the top.

Check-chain. 68, fig. 1963; 18, figs. 155, 158-60. A chain attached to a truck and the body of a car to prevent the former from swinging crosswise on the track in case the wheels leave the rails. Such chains are usually attached either to two, or to each of the four corners of a truck and to the sills of the cars.

At 8th Annual Convention, Cincinnati, 1874, it was "Resolved, That truck and car-body check-chains are, when properly applied, a valuable acquisition on passenger equipment, and your committee recommend their general use."

The difficulty with most check-chains is that the eyes by which they are attached to the body and truck are not strong enough to resist the strain, and that the chains themselves are too long to come to a bearing soon enough to have the trucks controllable.

Check-chain chafing-plate. A plate attached to a truck-timber to resist the wear of a check-chain.

Check-chain eye. See *Body check-chain eye*. *Truck check-chain eye*.

Check-chain hook. See *Body check-chain hook*. *Truck check-chain hook*.

Check-plates (American automatic compression brake). 22, figs. 868-9. Cast plates sustaining the pawl which engages with the pendent lever.

Check-valve (Westinghouse driving-wheel brake). A

ization produced when some cast-iron are allowed to solidify in a (usually iron) mould. The wheel is called the *chill*. The process is sometimes called *chill-moulding* has been given to this. *Chill-moulds*, recommended at the Centennial Exhibition, Philadelphia, 1876, for the point indicated in fig. 2150, in. Chilling was invented in the name of the inventor is not as never patented. All cast-iron are chilled wheels. But few property, and the philosophy of derstood.

crack developed in casting of the tread of car-wheels. wide, and not extending to the rim as injuring the wheel or as inferior quality. Iron which car-wheels is most liable to

A stove for heating cars, irer.

926-936. See *Lamp-chimney* sections.

Lamp-globe chimney.

Smoke-pipe.

Stove-pipe.

Stove feed-door, Bissell heater). Fig. 1, frame of the feed-door forming a part of the *Cinder-trap* (Gouge heater). 6, fig. 2, receptacle and opening through the bottom of the *injector-pipe*, in which with the exterior air supply from the boiler collect and be removed from time to time. *Circulating-drum* (Baker heater).

1801. A cast-iron vessel with hemispherical top of the car, filled with water, and pipes with the coil in the stove and which extend through the car. As the water comes heated it ascends to the drum and descends through the other pipe to the car. After passing through the car back by return pipes to the coil, where. Thus a continuous circulation is kept up. In the Searle heater is called the *expanding* *Circulating pipes* (Johnson and others).

A general name for the pipes which convey other heated fluid through the car and the heater. The term *radiating-pipe* is also used. *Circular tail-light*. Fig. 963. See *Sig. Clamp*. 1. "In general, something that is a piece of timber or of iron used together."—*Webster*.

2. (Joinery). "A frame with two tips which two portions of an article are joined together, either while being formed

this purpose is by measurement of the distance in the clear from inside to inside of car-wheel. By resolution of the Master Car-Builders' Association, 1888, the standard clearance, fig. 1996, for flanges, was fixed at 4 ft. 5½ in. The proposition to fix the limit at ½ in. either way from 4 ft. 5½ in. is now pending. Until the thickness of flange, which now varies greatly, has been reduced to some standard, this proposition will still leave the clearances of the flanges a variable quantity.

Clear-story. 110-11, figs. 155-85. "An upper story or row of windows in a church, tower or other erection, rising clear above the adjoining parts of the building."—*Webster*. Also spelled *clere-story*.

Hence, the portion of a passenger car roof which rises above the roof proper, in the manner which is now customary in nearly all American passenger cars, has been termed the clear-story, and this name was exclusively used in the former edition of this dictionary. Since the issuing of the first edition the use of the term *deck* for clear-story seems to have become practically universal among car-builders and manufacturers, especially in compound words. Those manufacturers consulted have unanimously replied that they used no other term than *deck*, and that they do not find the term clear-story used in the letters received from railroad officers. Therefore the term *deck* or *upper deck*, which see, has been exclusively used in this edition in designating the various furnishings and parts of the framing formerly designated clear-story, as, *deck sill*, *deck sash*, *deck-sash opener*, etc., for *clear-story sill*, *clear-story window*, *clear-story window opener*. As a general name for designating the entire space included within the upper deck, however, the term clear-story seems to be quite frequently used.

The clear-story is a comparatively modern introduction in American car framing, its general use dating from about 1860. Certain forms of cars, as fig. 50, have no clear-story. The part corresponding to a clear-story in freight cabooses, figs. 44-7, is termed a *lookout*.

Cleat. "1. A narrow strip of wood nailed on in joinery. 2. A term applied to small wooden projections in tackle to fasten ropes by."—*Webster*.

Cleveland truck. A *Diamond-truck*, which see.

Clevis. "A stirrup-shaped metallic strap used in connection with a pin to connect a draft-chain or tree to a plow or other tool."—*Knight*. The term is applied to various kinds of irons resembling a plow clevis in shape, and also to bolts with forked ends. See *Boom-cap clevis*, *Brake-lever clevis*, *Draw-clevis*, *Hoisting-block clevis*.

2. (Of padlock.) 7, fig. 1081. The means for attaching the guard-chain which prevents carrying off the padlock when unlocked.

3. (Of pile-driving hammer.) 2, figs. 1831-4. See *Hammer*.

Clevis-hook (of "American" steam tender brake). 11, fig. 866-7. The connection of the brake-chain to the brake-lever.

Clinch-nail. A wrought-iron forged nail, so named because it can be bent or clinched without breaking. *Cut nails*, the common and cheapest kind, although of wrought-iron, will not clinch.

Clinker-door (and door frame, Bissell heater). Fig. 1895. The part commonly called ash-pit door.

Clinker-grating (Bissell heater). Figs. 1869-75. A second and lower grating to facilitate removal of clinkers.

Clip. A U-shaped strap for attaching any body, more particularly a pipe, to the side of a partition. See *Berth-spring clip*, *Deck-sash quadrant clip*, *Pipe-clip*.

Closed-door stop (freight-car doors). 72, figs. 83, 87, 93. A block of wood or iron to prevent outside sliding-doors from moving too far when they are closed. See also *Open-door stop*.

Close return-bend. Fig. 1837. A short cast-iron tube made of a U-shape, for uniting the ends of two wrought-iron pipes. It differs from an *open return-bend* in having the two branches in contact with each other.

Closet. 1. A small room, usually for storage. See *Linen-closet*, *Wine-closet*, etc., figs. 306-15. A *locker* is a closet of less than the full height of car, but this distinction is not always observed.

2. A retiring room for sanitary purposes, more commonly called a *Saloon*, which see.

Closet-hopper. Figs. 1093-6; 131, figs. 169-90. Also called *soil-hopper*. A metal or porcelain hopper used in saloons.

Closet-hopper ventilator. Figs. 1097-8. See *Bell's exhaust hopper-ventilator*.

Cluster-spring. Figs. 2067-2106. A *group-spring*. See *Spiral spring*.

Clutch-coupling. See *Brake-hose coupling*.

Coach. Figs. 48-63. A term used to designate cars for the conveyance of passengers, in distinction from freight, baggage and express cars. The term was originally proposed by John B. Jervis. See "Railway Property," page 173. By increasing usage the term is used as an equivalent for *day-car* in distinction from sleeping cars

A car especially designed for platform-cars with side-
t purpose; but the stand-
-wheeled cars, with drop-
r, six and eight wheels, also
sed. The modern tendency
capacity up to 50,000 or even
0,000-lb. coal-car, standard

Hopper-bottom coal-car.
Iron-hopper coal-car.

oil burner. Figs. 872-906.
9, 1551.

. Figs. 1222-3. See *Seat*.

s. 1132-3 and 1171. A device
inged at the seat-back by a
sing the back is raised up,
eat-back give as high a sup-
seat-back hung in the ordi-
bb's *striker-arm*, which see.
1603. "A spout; an instru-
e liquor from a cask, vat,
ucet for the various forms,

Release cock.
Reservoir drain-cock.
Self-closing cock.
Stop-cock.
Telegraph-cock.

Cold-air pipe (Spear heater). 2, figs.
heater). Fig. 1350. A pipe by which
ducted from a hood on top of the ca
the stove, and into the air-space betw
the stove casing. In the Searle hea
feed-pipe. In the Gouge, the *injector*
2. (Winslow heater.) Fig. 1533.

the smoke-pipe and connecting with
on the roof, through which the cold
motion of the car down past the st
box. The usual size of pipe is 8½ in. d
pipe inside being 5 in. diameter.

Cold-air supply-pipe (suspended heat
1532.

Cold feed-pipe (Searle heater). F,
Cold-air pipe.

Cold-shot. Small globules of iron
gun-shot, which are found in the ch
iron wheels.

Collar. "A ring or round flange up-
ject."—*Knight*. Ordinarily an *axle*
meant.

See *Deck-collar.* *Lamp-c*
Dust-collar. *Reducti*
Expanding-collar.

2. (Creamer brake, which see.) 1

3. (Of journal.) F, fig. 1974; 32,
etc. A rim or enlargement on the
which takes the end-thrust of the
muley axle has no collar.

4. (For smoke-bell stem of Harr.

tine and driers, as little oil as possible being used, only sufficient to prevent the color from rubbing off. Twenty-four hours are allowed to each coat to dry, and the process of varnishing then follows, which varies greatly in the time and care given to it, but which is always very carefully done. See *Finishing varnish and painting*.

Column. 1. (Diamond and other trucks.) Fig. 1785; 37, figs. 1907-86. Another and perhaps more common name for a *Bolster guide-bar*, which see.

2. (Of crane.) Δ , fig. 145. Another name for the *mast*, especially when entirely supported from below.

3. (Hartley chair.) 12, figs. 1154-8. See *Pedestal*.

Column-bolt. 109, figs. 1921-2. A bolt passing through the arch-bars and holding the column in place and the truck-frame together.

Comb-rack. Figs. 1582-4.

Combination. The following list of parts of the Janney-Miller combination coupler are designated sometimes with and sometimes without the prefix "combination." See *Janney-Miller coupler* and the names of the several parts, omitting the word "combination."

Combination ball-joint washer. 59, figs. 555-635.
 " **barrel.** 40, figs. 542-554, 555-601. The barrel or shank to which the *Janney head* or *Miller hook* is secured.
 " **chasing-plate.** 50, figs. 542-554, 555-601.
 " **connecting-pin.** 64, figs. 542-554, 555-601.
 " **end face-plate.** 46, figs. 542-554, 555-601.
 " **eye-bolt** (for *Miller hook*). 66, figs. 542-554, 602-35.
 " **follower.** 99, figs. 542-554, 602-35.
 " **follower-guide.** 100, figs. 542-554, 602-35.
 " **head** (*Janney-Miller coupler*). 39, figs. 542-554, 555-601. A head for the *Janney coupler* substantially similar to the ordinary form, but adapted for use in the *Janney-Miller combination coupler*.
 " **horn.** 48, figs. 542-554, 555-601.
 " **Janney barrel.** 40, figs. 542-554, 555-601.
 " **head.** 39, figs. 542-554, 555-601.
 " **large equalizing-guide.** 47, figs. 542-554.
 " **lower jaw-pin.** 97, figs. 542-554, 602-35.
 " **Miller buffer.** 42, figs. 542-554, 555-601.
 " **buffer-yoke.** 44, figs. 542-554, 555-601.
 " **head.** 41, figs. 555-601.
 " **stop.** 43, figs. 542-554, 555-601.
 " **stop bolt.** 56, figs. 542-554, 602-35.
 " **platform-lever jaw.** 58, figs. 542-554, 602-35.
 " **platform-lever plate.** 57, figs. 555-635.
 " **open link for Miller hook.** 98, figs. 542-554, 602-35.
 " **platform-lever.** 69, figs. 542-554, 555-601.
 " **pull-rod.** 53, figs. 542-554, 555-601.
 " **side-spring.** 55, figs. 555-635.
 " **bolt.** 52, figs. 542-554.

Combination side-spring eye-bolt. 67, figs. 542-554.
 " **plate.** 45, figs. 542-554, 555-601.
 " **plate washer.** 101, figs. 555-635.
 " **stirrup.** 54, figs. 542-554, 555-601.
 " **trigger.** 63, figs. 555-635.
 " **washer.** 60, figs. 555-635.
 " **small equalizing-guide.** 49, figs. 542-554, 555-601.
 " **stop-brace, Janney.** 115, figs. 542-54.
 " **stirrup.** 51, figs. 542-554, 555-601.
 " **swivel.** 61, figs. 542-554, 602-35.
 " **swivel-hook.** 62, figs. 542-554, 555-601.
 " **trap-door.** 68, figs. 555-635.
 " **spring.** 65, figs. 555-635.
 " **yoke, Janney.** 9, figs. 542-554.

Combination baggage-car. Fig. 58. A baggage-car having compartments for express or mail, or both, as well as for baggage. See *Combination car*.

Combination car. Fig. 51. A passenger car, one portion of which is devoted to passengers and the other to the conveyance of mail, baggage or express. A *combination baggage-car*, which see, is also a combination car. Combination freight cars are also built, as *combined box and stock-car* (Fig. 9), but are not generally so termed, since they are not intended for more than one use at one time.

Combination-cock. Fig. 1802. (For Baker heater.) 25, figs. 1801, 1828. A cock with funnel attached, used at the top of a tank for filling. When opened with the key it allows the inward passage of the water, and at the same time the outward passage of air through a separate channel. Hence the name.

Combination elliptic-spring. Fig. 2041. An elliptic-spring with which auxiliary rubber bearings at the ends are combined. The load, instead of resting on the centre of the spring, bears on two rubber bearings, each placed about one-third the length of the spring from the end. Little used.

Combination single-plate wheel. Fig. 2182. A wheel with a single centre-plate, but with a recess cast around the hub.

Combination-wheel. A term applied by Mr. Lobdell to a wheel which he patented, and which has a projection cast on the inside of the rim opposite to the flange.

Combined label-holder and drawer-pull. Fig. 1077.

Combined reflector and chimney-holder. Figs. 866-888.

Combined triple-valve, reservoir and brake-cylinder (Westinghouse freight brake). Fig. 352. To lessen the complication and reduce the cost of freight brake-gear

passenger brake-

h curtain-rod

205. Nearest
piece of brass
shaped so as
entering and
in outside the

70, figs. 205-7.

A small brass
carrying the
outside the

g. 210, etc. A
sh carriages it
an parlor and
ts often occur,
a for a passage
rooms.

ish). A coach
e class of pas-
for passage is

abuts against it. An *end compression-beam*, fig. 159, is sometimes used. The compression-beam is sometimes made double, one above the other, with separate *braces* (*main compression-brace* and *centre compression-brace*) acting upon each, as in figs. 159-60.

Compression-beam brace. 2, fig. 644. A brace used in connection with a compression-beam to form a truss in the side of a passenger-car. It is sometimes stiffened by a *centre counterbrace*, 165, fig. 159; and sometimes two or more braces are used, as in fig. 159. They are then termed *main compression-brace*.

Compression brake. Figs. 368-9. A general term designating the class of brakes, none of which are in general use, which derive their power from the compression of the drawbars produced by momentum when brakes of an ordinary form are applied at the head of a train. A great variety of such brakes have been invented and patented, but the only one deemed to have obtained sufficient prominence for insertion in this volume is the "American Brake Co." compression brake, figs. 368-9. In that brake, when the drawbar is compressed the *push-bar* 15 catches the *pendant lever* 16, and so applies the brakes through the *lower connecting-rod* 23, the *relief-arm* 25, and the *three-holed screw* 27. The principal

Compression-lever (Cowell platform and coupler). 10, fig. 557. A *platform-lever*, extending above the car-platform, by which, with the aid of the *adjusting-wedge* (6) and other parts beneath the platform, the pressure of the *buffer springs* (14) is applied to the buffers.

Compression-member. Any bar, beam, brace, etc., which is subjected to strains of compression, and forms part of a frame, truss, beam, girder, etc. *Struts*, *body-braces*, etc., are *compression-members*. Similarly *tension-member* is used for tensile strains.

Compression-rod brake. Fig. 227. An inner-hung brake with a *single lever*, which is connected with a brake-beam farthest from it by a rod or bar which is subjected to a strain of compression when the brakes are applied. The pressure on the brake-blocks is not equal. Figs. 249-51 is a better plan.

Compromise-wheel. A *broad-tread wheel*, which see, for running over slightly different gauges. Little used.

Concave elliptic spring. Fig. 2087. A style of spring in which the plates are dished or concave, with the object of stiffening the plates, holding them more firmly in their relative positions, and throwing the edges of the plates wholly into compression so as to diminish the danger of fracture by the gradual development of cracks.

Concealing urinal. One designed to be opened for use by a handle at the top, and then closed up flush with the wood-work so as to be invisible. They are in limited use but not generally approved.

Concealing water-closet. Fig. 213. A form of closet covered with a seat to resemble an ordinary chair or sofa.

Condensing diaphragm (refrigerator cars). D, fig. 131. Sheets of metal placed in the cold-air flue on which moisture may be precipitated.

Conductor (Tiffany refrigerator car). 2, fig. 130 a. The drip-pipe from the ice-pan. See also *Heat conductor*.

Conductor's car. Figs. 44-7, 104j. A *caboose car*, which see.

Conductor's lantern. Figs. 974-9. One with an extra sized *ball* attached to it by which it can be held on the arm, leaving the hands free. It is sometimes provided with a *reflector*, fig. 977. They are often elaborately finished and usually bear the name of the conductor cut on the globe.

Conductor's-valve (Westinghouse brake). 21, figs. 311,

393, 324-5. A valve for applying the train brakes placed at some convenient point in a car, usually in the saloon, and operated by a cord extending through the train within reach of the conductor.

Conductor's-valve discharge-pipe (Westinghouse brake). 24, fig. 333. A pipe leading from the conductor's valve down through the floor of the car.

Conductor's-valve pipe (Westinghouse brake). 23, fig. 634. Connects the brake-pipe with the conductor's-valve. Cone. 1. (For berth spring.) 2, fig. 1249. A *berth-spring fusee*, which see.

2. (Graduated bolster-spring.) 2-4, figs. 2096, etc. A projecting sleeve on the spring-plates to serve as guides or distance for the springs. They are distinguished as *lower* and *upper*.

Cone lamp-shades. Figs. 942-4. See *Lamp-shade*.

Coned closet-hopper. Fig. 1091. See *Closet-hopper*.

Congdon brake-shoe. Figs. 339-40. A brake-shoe invented and patented by Mr. J. H. Congdon, Master of Machinery of the Union Pacific Railroad. It consists of a cast-iron shoe with pieces of wrought-iron cast in it in the face or rubbing surface so as to give it greater endurance. See *Brake-shoe*.

Connecting chain (pile-driver car). 44, fig. 1822. A *pitch-chain*, which see, connecting the *pitch-gear* on the two axles of a truck used for making the car self-propelling, which is hardly the common practice.

Connecting-pin (Janney-Miller coupler). 64, figs. 542-551, 602-35. The steel pin securing either the Janney *head* or the Miller *hook* to the shank of the Janney-Miller combination coupler.

Connecting-rod. Figs. 227-33. A rod which connects two or more parts or objects together. See *Brake-shaft connecting-rod*. *Floating-lever connecting-rod*.

2. (Creamer brake, which see.) 8, fig. 263.

3. (Hand-car.) 24, figs. 1720-23. The iron rod which connects the *bell-crank* and the *crank-shaft* together. In figs. 1724-6 there are two connecting-rods and they are attached directly to the propelling-levers.

4. (Hoit draw-gear.) 185, fig. 94. Two bolts on either side of the centre-sills connecting the two needle-beams or cross-frame tie-timbers together, thus serving, in connection with the draw-rod 182 to constitute in effect a continuous drawbar. Also termed *cross-frame tie-rods* or *centre draw-rods*.

e, which see, which passes the car, across and under the distinction from a *profile* nt to follow the outline of

L The body counterbrace d into one long rod passing the other, as in figs. 159-60, rmed a *continuous counter-s-rod* or *hog-chain rod*. 24-5. A patented draw-gear, ractive strains, relieving the o-gear, figs. 426-7, is another ass.

ar-truck with an iron frame, re all made in one piece. of such trucks.

69, figs. 118-119. Nearest *de rail*. A side-board run nd of a wagon in order to in tying the ends together. figs. 1948-50. An iron bar a rectangular shape so as to truck-frame.

of those recommended for ers' Association. So called See *Automatic freight-car*

er show certain cord, neither of which ever, to any appreciable extent.

Cord-lever (of car signal-valve, Westingh app's, which see). 6, figs. 688-9. The l pull on the signal-cord actuates the valv Cork wall (refrigerator cars). C, figs. 1 the means of insulation.

Corner-casting. A *Knee-iron*, or a *corner*. See also *Roof corner-casting*.

Corner handle, more commonly *grab-i* 102, figs. 87-188.

Corner pillar (English). 94, figs. 204- equivalent, *corner-post*. An upright pie of the body.

Corner-plate (freight-car bodies). 55, 185. A wrought or cast iron angle-plat outside corner, to strengthen and pro There are usually three corner-plates, : *middle*. Very commonly a *push-block* cast upon the lower corner-plate.

Corner-post. 43, figs. 82-142; 61, figs. 1 right stick which forms the corner of the body. The corner-post is omitted in a few cars, figs. 190, etc.

Corner-post brace (tip cars). 163, fig. 14: cial to the car shown.

Corner-post ornament. An ornamental outside corner of a passenger car. Mod: commonly so ornamented.

Corner-urinal. Figs. 1100-5. So called in distinction from a side-urinal.

Corner urinal-handle. Fig. 1107. See above and *Urinal-handle*.

Cornice. 93 and 94, figs. 175-6. The mouldings at the eaves of the roof outside of a car, and where the ceiling joins the sides and ends of the car inside. There is, therefore, an *inside* and *outside cornice*. See also *Deck inside-cornice*. *Window-cornice*.

Corridor (Mann boudoir and other sleeping cars). Figs. 198, 311-2. A passage running at one side of the Mann car from one door to the other, affording access to the compartments. The Mann cars are the only ones in general use having such corridors for the whole length of the car, but all sleepers have longer or shorter corridors to pass the state-rooms, smoking-compartments, etc.

Corridor-carriage (English). A passenger-vehicle having a passage from end to end along one side, the various compartments having doors which open into this passage. Little used. See also *Carriage*.

Corrugated car-wheel. Figs. 3144-45. See *Car-wheel* and *Thacher corrugated wheel*.

Corrugated key (Yale lock, which see). Fig. 1028.

Corrugated-metal car-roof (freight cars). Figs. 664-9. A roof consisting of iron, steel, or zinc plates covered with boards, which run lengthwise, and rest on *roof-strips* on top of the rafters and carlines. Two forms are illustrated, the *Winslow* and *Empire car-roofs*, which see. See also *Car-roof*.

Corrugated-mouldings. 1 to 15, figs. 1050-64. See *Waved mouldings*.

Corrugated-rubber floor-mat. Fig. 807. So called in distinction from *perforated-rubber floor-mats*.

Corrugated Yale lock. Figs. 1027-28. See *Yale lock*.

Corrugations (Atwood hemp-packed wheel, which see). Fig. 2168.

Corticine. A form of floor-covering much like *linoleum*, which see, composed of linseed oil, prepared by a special process, mixed with ground cork and placed upon a strong backing of water-proof canvas.

Counter-boring. An enlargement or other alteration of form for a certain portion of its length of a hole bored in any substance. In slats, see *Wilson's flexible-car window-blind*, 6, figs. 1645-6.

Counterbrace. 3, fig. 644; 2, fig. 645; and 165-6, fig. 159.

In *bridge-building*, a brace which transmits strains in the opposite direction to a main brace, as 9, figs. 2181-8. In *car-building*, a counterbrace usually means a brace in the side of the body between its ends and the body-bolster. Sometimes, however, as at 165-166, fig. 159, there are two styles of counterbraces, one of which, 165, near the middle of the car, is alone a counterbrace proper, in the technical sense, and called *centre counterbrace*, while the other, 166, is designated as the *counterbrace*, and generally the only counterbrace recognized in car-building. See *Body counterbrace*.

Counterbrace rod (of a truss). 11, figs. 2183, 2185. An inclined rod which acts as a counterbrace. See above, and also *Body counterbrace-rod*.

Coupler. That which couples. In relation to cars the term usually designates the appliances for coupling or connecting cars together, and usually means some form of automatic coupler. See *Automatic freight-car couplers*, figs. 409-428, and *Blackstone, Cowell, Janney, Janney-Miller and Miller couplers* (passenger), figs. 537-643.

Couplet (of springs). 80, figs. 1912-27. Two elliptic springs, which see, placed side by side, to act as one spring. Three springs united in this way form a *triplet*, four a *quadruplet*, five a *quintuplet*, six a *sextuplet*.

Coupling. "That which couples or connects, as a hook, chain, or bar."—*Webster*. A coupling-link is often called simply a coupling.

See *Basin-coupling*.

Bell-cord coupling.

Berth curtain-rod coupling.

Brake-hose clutch-coupling.

Brake-hose coupling.

Clutch-coupling.

Coupling-link.

Head-board coupling.

Hose-coupling.

Pipe-coupling.

Reducing pipe-coupling.

Screw-coupling (English).

Coupling-bar. 19, figs. 249-51. See *Brake-lever coupling-bar*.

Coupling-bar pin (brake gear). 20, figs. 249-51. A pin for the *Brake-lever coupling-bar*, which see.

Coupling-cap. See *Brake-hose-coupling cap*, figs. 327-8.

Coupling-case. See *Brake-hose-coupling case*, figs. 327-8.

Coupling-chain, or chain-coupling-link. 8, fig. 109. A three-link chain used in coupling to *draw-hooks*, which see. See also *Safety-coupling-chain*, figs. 428-30.

Coupling-hook. 11, figs. 636-43. A hook for coupling

in freight cars with ordinary together by *coupling-pins*. Called simply *links* or *couplings*. designed to prevent too rapid *couplings* are kept on hand for unequal height. The *Potter coupling-link*. *Chain coupling-hooks*. Link and pin couplings common, and some form of *auto-coupling* which see, will probably soon supersede. See

Fast coupling-link.
Triple coupling-link.

116-118. A link forming part of *draw-chain*. The open-ended *draw-hook* or *draw-bar* is the intermediate links are sometimes, and the end link the *long link* is often used instead of three

drawbar. 1, figs. 449, 451. *coupling-link* is attached.

189; figs. 436-7, 443-6. A short *coupling-link* is connected to a *coupling-link* distinguished as *eye-head* or *solid-head*, fig. 446. They are also called *Potter drawbar* has a *fast*

couplers.) 17, figs. 542-554, are carried for emergencies or with a link

Coupling-shackle (English). 41, figs. 41, 42. The end link of the coupling which connects to the shank of the *Draw-hook*, which is attached to the *Draw-hook*. **Coupling-sleeve** (Kirby's car-door lock). A screw coupling making the door continuous.

Coupling-spring (Miller coupler). 4. Made of two or more flat and round bars which bear against the back of the *Draw-hook* so as to cause it to engage the adjoining car; also called the *leaf-spring*. **Coupling-spring bracket** (Miller coupler). A cast-iron lug attached to one of the *Draw-hooks* to which a bolt is fastened for increasing the coupling-spring.

Coupling-valve. See *Brake-hose coupler*. **Coupling-valve key** (Westinghouse). Cover.

See *Drum-cover*. U
Journal-box cover. W
Man-hole cover.
Moulding-joint cover.

Covered wagon (English). A road vehicle for conveying freight liable to be stolen in damp. It has side doors which can be raised or lowered in the roof so that the cargo is readily hoisted. As a rule, *tarpaulin* open cars are used in England.

Cover plate (Atwood hemp-packed). A ring covering the packing inside of a steel-tired wheel is a disk connecting

Cowell buffer and coupler. Figs. 53-541. A device for automatically coupling passenger cars and forming a continuous floor between them. Its buffer is also a supplemental platform, inclosing buffer-springs, and overlapping or inclosing the car sill. Such interaction between the coupler and the buffer exists as that when the coupler is drawn out and the draft-spring compressed the buffer moves out the same distance, thus keeping the twin buffers always in contact. The coupler is much like the Miller, but with its drawhead pivoted to the drawbar. It is easily uncoupled with one lever. See this device on Wagner and Pullman vestibule cars.

Crabs, or tongs (pile-driver car). 22, figs. 1821-4. (Wrecking car). Fig. 144. See *Tongs*.

Crane (pile-driver car). 34, figs. 1821-4. See *Pile-driver car* and *Derrick*.

Crank. 1. "Literally a bend or turn; hence an iron axis with a part bent like an elbow, for producing a horizontal or perpendicular motion by means of a rotary motion or the contrary."—*Webster*. See *Bell-crank*. See also *Brake-shaft crank*, *Door-shaft crank* (street cars).

2. (Of a derrick or crane.) 13, figs. 77-78; W, figs. 151-3. The L-shaped handle by which the driving gear is actuated.

3. (Of a lever hand-car.) 5, figs. 1724-6. The *bell-crank* (which see) of a hand-car, 23, figs. 1720-3, is at the upper end of the connecting-rod, the *crank* at the lower end.

Crank hand-car. Figs. 1708-10. A hand-car which is worked by one or two cranks connected by gearing with the axles of the car. Originally in almost universal use, it is now nearly obsolete in favor of *Lever hand-cars*, which see.

Crank-shaft (lever hand-cars). 6, figs. 1720-23. A short wrought-iron shaft to which a crank of a hand-car is attached, which is turned by suitable levers and is connected by gear-wheels with one of the axles of the car.

Crank-shaft bearings (hand-car). 5, figs. 1724-6; 7, figs. 1720-23.

Creamer automatic ventilator. Figs. 1566-9. See *Ventilator*.

Creamer lamp-fastening. Fig. 647. A mode of attaching lamp-bottoms by what is in substance a clevis catch,

preventing the rotation of the lamp-bottom, and holding it fast by a spring at the side.

Creamer safety-brake. Figs. 263-5. A brake invented by William G. Creamer, of New York, now practically obsolete. It consists of an involute spring which is attached to and acts on the brake-shaft. This spring is contained in a case or drum 1, fig. 263. Before a train starts on a trip the spring is wound up and held in a state of tension by a pawl 6. In case of danger the pawl is disengaged by a lever 7, connected to the rod 8, which is operated by the bell-cord. By this means the locomotive runner, conductor, or brakeman can at any time apply all the brakes, or they will be applied by the separation of the train. It was never intended for use except in emergencies, and has been supplanted by *Air-brakes*, which see.

Creamer solid-nipple seat-arm. Fig. 1170. See *Seat-arm*.

Crib-rail (English). 64, figs. 116-119. A longitudinal piece of timber secured to the upper part of the outer side of the *sole-bar* and supporting the body of the vehicle.

Cricket-iron. A *Seat-stand*, which see.

Crooked coupling-link. Figs. 431-2, 441-2. See *Coupling-link*.

Crooked end-piece (wooden truck frames). 17, figs. 1944, 1947. An outside end piece hollowed out on top by cutting away the wood so as to clear the draw-timbers and drawbar fixtures.

Cross-bar (Cowell coupler). 5, fig. 538. A lever, fixed at one end and adjustable at the other end by the *adjusting-wedge* 6, operated by the *compression-lever* 16, which applies the tension to the *buffer springs* 14.

2. (Creamer brake, which see.) 2, figs. 263-4.

3. (Gouge heater.) Figs. 1423. The part on which the movable *grate* rests.

4. (Swing link-hanger.) 4, figs. 2110-1. The bar supporting the *cross-bar casting* which carries the *spring-plank*. Also called *mandrel-pin* and *lower swing-hanger* pivot.

Cross-bar back-rest and front-rest (Gouge heater). Figs. 1433, 1444. Parts fastened to the fixed *grate* to hold up the cross-bar.

Cross bar casting, or spring-plank carrier (swing link-hanger). 3, figs. 2110-1. See *Cross-bar*.

ie-rod, which see. **A⁸**, fig. 3. 155-85.

re draw-rods (Hoit draw-rods connecting the two crossing the purpose of a confitting straine received from rod 5.

edle-beam. 22, figs. 82-91,

A transverse timber bolted longitudinal sills and floor tim- the bolsters, and to which sta, or truss-blocks, are at- used under a car-body.

h see, taken from bridge engi- general use than any other one as short as any and exactly de- med by the stick, seems fairly ther names are *body-transom*,

s-beam truss. Fig. 224. A cross-frame tie timber. For s, *king-post*, *truss-rod*, *truss- ring*.

lg. 224. See above.

driving-wheel brake). 6, fig.

4. A wrought-iron I-shaped end of the piston-rod, and to links are attached, to connect centric levers which work the

very indefinite term for a right spring and quite flush with the surface to which it is a has a beveled bolt, which snaps shut.

Cupboard-latch. Fig. 998. See above.

Cup-holder, or tumbler-holder. Figs. 1576 or rack for holding a drinking-cup. See holder.

Cup-leather (for piston-rod of Westinghe wheel brake-cylinder). 7, figs. 814-5. A ordinary gland packing.

Cup side-bearing. 61, figs. 1987-87. A sid trucks, with a receptacle for holding of Little used.

Cup-washer. A *Socket washer*, which see.

Curled hair. Hair from the tails or ma horses, etc., which is first spun into ropes into coils, and either steeped or boiled in this the coil is dried and the hair un leaves it in a curly and elastic state, suit cushions, etc.

Curtain. A cloth hanging in front of or arc or object, as a window or sleeping-car ber may be contracted or spread at will. Tl ever, is usually restricted to loosely hung pended on a *curtain-rod* by *curtain-hoo* distinction from a *shade* which is flat and tains in cars are chiefly used for slee (*Berth curtains*, which see), and for the s *street cars*, which see. *Window curtains*

Curtain-holder. See *Magnetic curtain-holder*.

Curtain-hooks (sleeping berths). Figs. 1966-8.

Curtain-rings. 82, figs. 694-5. Rarely used. See *Curtain*.

Curtain-rod. Fig. 1693; 30, fig. 694. (English.) 190, fig. 906. A bar to carry a curtain hung upon rings sliding freely along the rod.

Curtain-rod bracket (English). 192, fig. 905.

Curved seat-stop. Figs. 1180-1. See *Seat-stop*.

Cushion. Figs. 1205-23. Cushions used in passenger car upholstery are designated as *squab* cushions or *box* cushions, the latter being those built upon and connected with a wooden frame-work (*cushion-frame*), and the former a detached pad to be placed on a seat. Squab cushions are now rarely if ever used, but were formerly common. See *Seat-cushion*.

2. (Cowell coupler.) 23, fig. 538. See *Rubber cushion*. A platform buffer-spring.

Cushion back-rail (English). 151, figs. 905-6. In a carriage a small transverse bar which confines the hind end of the seat-cushion.

Cushion-frame. 17, fig. 1121; figs. 1205-23. A wooden frame to which the seat-springs and upholstery of a car-seat are attached.

Cushioning-blocks (for Thomas' steel-tired wheel). B, fig. 2175. Blocks of wood inserted under pressure in the *cushioning-pockets* of the *radial-arms*.

Cushion weather-strip. Fig. 1699. See *Weather-strip*.

Cuspidor. Figs. 809-11. A vessel to receive discharges of spittle, and having a wide rim so that if it is upset its contents will not be spilled. It is the modern substitute for a *spittoon*, fig. 808, from which it differs only in form.

Custom-house standard seal-lock. Fig. 1015.

Out-off valve (Searle heater). C, figs. 1484-5. A valve for cutting off the water supply from the coil.

Cylinder. 1. A chamber or vessel whose ends are circular, and with straight parallel sides, as the cylinder of a steam-engine. The cylinders used in connection with cars and locomotives are made of cast-iron, and have pistons fitted so as to work air-tight in them. A variety of cylinders are used in brake apparatus, shown in figs. 264-309. Also see

Air-cylinder.
Brake-cylinder.

Reversing-cylinder.
Steam-cylinder.

2. A name sometimes given to the fire-pot of a stove or heater, as in fig. 1519.

8. (Ormsby sash-balance.) A, fig. 1708.

4. (Yale and Foster locks, which see.) Figs. 1036-38. **Cylinder-body** (Westinghouse brake). 2, figs. 307-31.

The main central portion closed by the *cylinder-heads*.

Cylinder brake-lever ("American" steam tender-brake.) 10, figs. 366-7. Same as the Westinghouse *cylinder-lever*, which see.

Cylinder-head. A metal cover for the end of a cylinder, held on by *cylinder-bolts* or *cylinder-studs*. The cylinder-head through which the piston passes is commonly termed the *back* cylinder-head and the other the *front* cylinder-head, corresponding to locomotive practice. In the Westinghouse air-pump and engine they are designated as *top* and *bottom* cylinder-heads. See *Cylinder*.

Cylinder-levers (Westinghouse brake). 7, fig. 325. Two levers which are connected together by a *tie-rod* attached near their centres. One end of one lever is attached to the cross-head of the brake-cylinder and the corresponding end of the other is attached to a bracket on the brake-cylinder head at the opposite end of the cylinder. The other ends of the levers are connected with the floating levers by rods.

Cylinder-lever bracket (Westinghouse brake). 4, fig. 325; 7, figs. 329, 331. A T-shaped piece of iron bolted to the front cylinder-head, to which one of the brake-levers is attached.

Cylinder-lever support (Westinghouse brake). 15, figs. 324-5. A wrought-iron bar bolted to one of the centre sills, on which the ends of the cylinder-levers rest.

Cylinder-lever tie-rod (Westinghouse brake). 14, fig. 325. See *Cylinder-lever*.

Cylinder release-cock (Westinghouse brake). 24, fig. 311. Also popularly called *bleeding-valve*. A cock attached to every car-brake cylinder for releasing the pressure on the piston from each car individually when the car is detached from the locomotive or the apparatus is out of order. This is called *bleeding* the brakes.

Cylindrical gauges. Gauges made for measuring the size of cylinders and cylindrical holes, often called *Whitworth gauges*. They consist of steel cylinders and rings hardened and ground very accurately to standard sizes. These fit into each other. The first is used for measur-

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the 16th Annual Convention, in Philadelphia, 1882, were amended in Saratoga, 1884 as follows (fig. 407):

Double dead-blocks are to be made 8 in. square on the face and 6 in. thick, and are to be placed 22 in. apart from centre to centre, and to have 14 in. space between them.

Single dead-blocks are to be not less than 30 in. long, 7 in. thick and 8 in. deep, measured vertically.

Dead-centre. "One of the two points in the orbit of a crank in which it is in line with the connecting rod."—*Knight*. To obviate the annoyance of having a dead-centre in hand-cars is one of the advantages claimed for the Cros-man hand-car. Fig. 1716.

Deadening, or deafening. The filling placed between the floor and the *deafening-ceiling* to serve as a non-conductor to heat and noise. *Mineral wool*, which see, is sometimes used for deadening, but commonly shavings, when anything at all is used. An *intermediate floor* (between the sills) and *deafening-ceiling* (under the sills) is in modern car-building the more usual reliance, as in figs. 195-203.

Dead-lever (of brake-gear). 5, figs. 338-9, etc. The one of a pair of levers to which the brake-shaft connecting-rod is *not* attached. The upper end of the dead-lever is confined within a *dead-lever guide*, which latter is provided

of a passenger car by analogy from the deck of a ship. The term is not applied in general use, however, to freight cars. The *deck* of passenger cars is subdivided into the *upper deck* (also called *clear-story*, which see) and *lower deck*, the roof at the side of the clear-story; but in designating parts which are not repeated in the upper and lower deck the term *deck* alone is used.

Since the issuing of the first edition of this work the use of the term *deck* instead of *clear-story* seems to have become practically universal among manufacturers of furnishings and in far more general use than any other among car-builders. The manufacturers and railroad officers consulted almost unanimously replied that they used no other term than *deck*.

Deck beam. A beam in the form of an inverted \perp with a round knob on the upper end, used in some forms of iron car construction. The Marden steel brake-beam, figs. 215-6, is a deck-beam.

Deck bottom-rail. 112, fig. 174; 57, figs. 1843-4. A horizontal timber running lengthwise of a car, fastened to the rafters or carlines of the main roof, or to the deck sill, which forms the base for the deck-posts.

Deck bridging. 2, 3, fig. 186. See *Bridging*.

Deck carline, or upper deck carline. 118, figs. 158-185; 60, figs. 1843-4. A timber which extends from side to side of the upper deck, and supports the roof boards. Corresponding parts in the lower deck are generally called *rafters*.

Deck-collar (Spear and other heaters). 6, figs. 1486-9. A sheet-metal ring to line the smoke-pipe opening through the roof, having a double sheet-metal tube to leave an air-space as a heat-guard, and a flange on the outside to exclude rain.

Deck eaves-moulding, or upper-deck eaves-moulding. 119, fig. 174. A moulding under the outside edge of the upper deck.

Deck end-panel. 116, figs. 158-185. It is frequently used as a ventilator.

Deck end-sill. 113, figs. 155-78. A horizontal timber connecting the ends of the deck-sills, and forming the base for the end of the upper deck.

Deck end-ventilator. See *Deck end-panel*.

Deck end-ventilator hood (street cars). 63, fig. 1848. A projecting screen, placed over the aperture of an end-ventilator to exclude snow and rain.

Deck inside cornice. 120, fig. 174. A moulding which

fills the interior angle where the upper deck joins the deck-side.

Deck-plate. 117, figs. 155-185; 4, fig. 186. A horizontal timber on top of the deck-posts or mullions to which the deck carlines are attached. Also called a *deck top-rail*.

Deck-post. 115, figs. 155-185; 58, figs. 1843-4. An upright piece of wood which connects the deck-plate with the bottom rail.

Deck-sash. 144, figs. 155-185; figs. 1632, etc. A glazed sash in the sides of the upper deck.

Deck-sash catch. Fig. 1627. A hook giving a simpler equivalent for a *deck-sash latch*.

Deck-sash double-ratchet. Fig. 1644. A special form of deck-sash pivot-plate, used with spring ratchets.

Deck-sash flush-catch. Figs. 1629. A *Deck-sash latch*, which see.

Deck-sash latch. Figs. 1627-36. A spring-bolt attached to a deck-sash, which engages with a deck-sash latch keeper or *strike-plate*. See *Keeper*.

Deck-sash latch-keeper. Figs. 1637, etc. See above.

Deck-sash lintel. 5, fig. 186. See *Lintel*.

Deck-sash opener. Figs. 1603-1626. A lever attached to a revolving rod by which a deck-sash is held in any desired position. A great variety of forms exist, including many patented devices. See engravings. A *pull-hook*, fig. 1556, is sometimes called a deck-sash opener, but a more elaborate contrivance is generally meant.

Deck-sash pivot. Figs. 1611-13, 1863, and generally 1614-65. A metal stud or spindle attached to a suitable flange by which it is fastened to a deck-sash, and on which the latter turns. A great variety of forms exist, including several patented devices, as Hart's, Monitor, Morgan's, etc., to render the sash readily removable and adjustable.

Deck-sash pivot bushing. Same as fig. 1654. See *Bushing*.

Deck-sash pivot-plate. Figs. 1612, 1864. A plate attached to the window-casing, with a hole or eye in which a deck-sash pivot works. Sometimes they are provided with springs to prevent the sash from rattling.

Deck-sash post, 6, fig. 186, should read *Deck-post*, which see.

Deck-sash pull. Figs. 1634-6. A screw-ring attached to a deck-sash to open and close it. Made either *with screw* or *with flange*.

1631. A hook attached to a pivot. See engravings.

Fig. 1642. A deck-sash pivot, with a spring to make the sash

right, consisting of a plate, rail, and screw, which forms the side which is between the lower and upper

sash, fig. 155; figs. 1556-7. This plate operates the door or valves and their closing the aperture.

85. A horizontal timber at the ends of the rafters, or short carlines, etc.

174, etc. Thin boards or mouldings of a deck-sill, for ornament.

Fig. 174, etc. A board on the projecting cornice of an upper deck.

Fig. 185. A *Deck-plate*, which see. *Deck side-ventilator*. *Deck side-ventilator* are the usual side-ventilators.

(See heater). Fig. 1408. An opening at the opposite end of the car from the slope downward so as to cause draught.

Fig. 1409. A piece of thin board to be inserted in the left projecting two or three

delivery-pipe used to cause a current of air to flow continually between the pipes and not produced in the expansion-drum on the roof.

4. (Of ventilators, which see.) D, 1569.

Deflector-springs (of ventilators). A, controlling the movement of the deflector. **Deflector-valve frame** (Gouge heater) above.

Delivery-pipe (Searle heater). Figs. 1569-1570. Connected to the outflow-pipe by a tee-joint, through which the hot air passes to the radiator. The other end of the tee-joint connects with the expansion-drum on the roof.

Delivery-pipe (suspended heater). G, generally called the *hot-air pipe* in other forms. **Derrick**. Figs. 151-3. "A form of derrick, the peculiar feature of a derrick, well distinguished from other forms of hoisting machines, is a boom stayed with a central post" (fig. 151) "which may be anchored, but is usually free to swing."

"A derrick has one leg, a *shears* leg, and a *crane* has a post and a *jib*," and is distinguished from other forms of hoisting machines by having a movable boom. "A *whinch* is a drum on a vertical axis on which a rope winds. The *whinch* is a drum for a rope, and is rotated by a handle. The *lass* has a horizontal barrel, and is rotated by a handle. The *winch* has a horizontal barrel, and is rotated by a handle. The means of winding up the tackle-ropes

"The invention is nautical, the original being the sailor's contrivance, made of a spare topmast or a boom, and the appropriate tackle. Such are used in masting, putting in boilers and engines, and hoisting heavy merchandise on board or ashore.

"The *derrick-crane* is a combination of the two devices, as its name imports, having facility for hoisting and also for swinging the load horizontally."—*Knight*.

Derrick-car. Figs. 73, 75-80, 144, 158. A strong platform car which carries a derrick, which is used for removing wrecked cars and engines, erecting bridges, or handling any heavy objects. Also called *wrecking-car*. They are distinguished as *hand* or *steam* derrick cars, according to the power used.

Derrick truss-rod. 19, figs. 77-78. A rod attached to the side-sills of a derrick car at each end and passing under the *mast-pocket* or other equivalent compression-block, constituting a truss to resist the pressure of the derrick.

Destination-board bracket (English). 183, fig. 205. A small shelf of cast or wrought iron secured to the upper part of the outside of the body, in order to carry a wooden board or enameled metal plate, giving the destination of a train. It is universally used on all English carriages, and carried throughout the entire trip.

Destination-card and rack (freight cars). Figs. 1048-9; 80, fig. 48. A convenience in increasing use, but usually conspicuous by its absence.

Detachable globe-holder. 7, figs. 868, etc. A globe-holder arranged so that a lamp-globe can readily be attached or removed. Many lamps have the globes fixed or *plastered*. Hence, often called *plaster-lamps*.

Detaching-slot (of deck-sash ratchet). B, figs. 1622-3. A slot in the ratchet-plate to facilitate removal of the sash.

Detective wire (for seals). Fig. 1117. A flat twisted wire or other equivalent device to prevent the seal being stripped from the wire without destroying one or both.

Detent-latch (Ormsby sash-balance). Figs. 1708-6. A device for holding the spring fixed at the desired tension when the sash balance is removed, and hence not loaded by the sash so as to balance its tension.

Diagonal (English). 4, figs. 117 and 206. American equivalent (used chiefly in street cars), *diagonal floor-timber*. A member of the underframe. One end butts

against the rear side of the transverse end member of the underframe (the *headstock*), and the other end butts against an intermediate transverse member of the underframe (the *cross-bearer*), near its centre. The *diagonal* takes the strain of the side-buffer, and distributes it so as to prevent distortion of the *underframe*.

Diagonal floor-timbers. 1, fig. 649. Floor-timbers which are placed in an inclined position to the sills. Used chiefly on street cars.

Diagonal roof-strap (street cars). A band of hoop-iron placed diagonally on the top of the roof-boards to stiffen the roof.

Diameter testing-gauge (for car-wheels). Fig. 2123. One of the M. C. B. standard gauges for testing wheels and axles.

Diamond-truck. Figs. 1907-40. A car-truck with iron side-frames consisting of two or more *arch-bars*, which see, and a *pedestal tie-bar*. The spaces between the arch-bars are diamond-shaped, whence the name. The journal-boxes are rigidly bolted to the sides. The cross-members of the truck, bolster spring-plank, etc., are still usually of wood, but, by increasing usage, of iron.

This form, it was voted, at the last Master Car-Builders' Convention (1884) should be the type used in preparing designs for a standard freight-car truck, to have also a 5 ft. wheel-base, channel-bar transoms, and either *swing* or *rigid bolster*, which see. It is already the type in almost universal use for freight cars. See *Truck*.

The *California* or *Allen truck* is an exceptional form of diamond-truck having a journal-spring, as in fig. 1959.

Diaphragm. 1. (Eames vacuum brake.) 1, figs. 268-73. An equivalent for the Westinghouse *brake-cylinder*, serving to operate the brakes. It consists of a cast-iron bowl-shaped *shell*, to which the *diaphragm-rubber* is attached by *diaphragm-rings*. A rubber *diaphragm-hose* connects it to the brake-pipe. Three sizes of diaphragms are manufactured: No. 4, for narrow-gauge cars, No. 8 for standard-gauge cars, and No. 2½ for heavy driver-brakes.

2. (Pintech gas pressure-regulator.) Fig. 818.

3. (Refrigerator car.) D, fig. 131. See *Condensing diaphragm*.

4. (Westinghouse brake and train-signal apparatus.) A considerable number of the various valves are regulated

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Disengaging bolt (Howard's parlor-car water-closet). Figs. 1087-89. An attachment by which the water-supply valve and the pan are disconnected from the bowl proper, so that the closet can be used as a plain hopper in case the water supply gives out.

Distance-block. A short, thick piece of wood placed between two or more objects to keep them apart, or to preserve an interval of space between them, as *floor-timber distance-block*, *truck-bolster distance-block*, etc.

Distance-gauge (between backs of wheel-flanges). Fig. 1996. One of the M. C. B. standard wheel and axle gauges.

Distance-piece. 2, figs. 452, etc. A metallic *distance-block*. See *Drawbar distance-piece*.

Ditching-car. Fig. 71. A car provided with derricks and scoops for excavating the ditches of cuts by the power of a locomotive. The contrivance is a patent controlled by the American Ditching Co., of La Crosse, Wis.

Dividing attachment (Eames, for engines fitted with drum-brakes). Figs. 274-5. A device to regulate the application of the brakes to either the locomotive or train, or both.

Dog. 1. A general term in mechanics for all devices which bite or take hold of or give motion to other parts.

<i>Clinker-door.</i>	<i>Lamp-case door.</i>
<i>Double-door.</i>	<i>Overhung-door.</i>
<i>Double fire-door.</i>	<i>Platform trap-door.</i>
<i>Draft-door.</i>	<i>Shaker-door.</i>
<i>Dust-door.</i>	<i>Sliding-door.</i>
<i>Dust hand-hole door.</i>	<i>Smoke-box door.</i>
<i>Fare wicket-door.</i>	<i>Sub-door.</i>
<i>Feed-door.</i>	<i>Tip-car door.</i>
<i>Fire-door.</i>	<i>Underhung-door.</i>
<i>Grain-door.</i>	<i>Ventilator-door.</i>

Door-apron (street cars). 1, fig. 1842. A sheet-iron cover attached to a swinging door to inclose the step.

Door-bolt. Figs. 758-61, 1081-3. A metal bar attached to a slide and fastened to a door so as to hold it shut from the inside. They are either *round*, or *barrel*, or *square*. A *square-neck* door-bolt is one with an angle or shoulder in it. *Flush* door-bolts are gained in so as to be flush with the surface. A *cupboard-catch* is a form of door-bolt having a beveled latch and actuated by a spring, but bolts so formed are commonly termed *Latches*, which see.

Door-bolt keeper. Fig. 760. A catch attached to a door-frame, in which the bolt engages.

Door bottom-rail. 114, figs. 204-205. See *Door-frame*.

Door bottom ventilator-rail (English). 112, figs. 204-205. A piece of wood running horizontally and supporting a sliding ventilator.

Door-brace (freight-car doors). 69, figs. 89, 182. A diagonal piece of timber framed to stiffen the door.

Door-butt. A *Butt-hinge*, which see.

Door-button. Figs. 751, 754. "A small piece of wood or metal swiveled by a screw through the middle, and used as a fastening for a door or gate."—*Knight*. They are often attached by a rivet or pin to a metal *door button-plate*, which is fastened on with screws. Sometimes the button is an eccentric disk.

Door-cap (freight-car doors). 177, figs. 98-6. A horizontal board across the top of the door.

Door-case. 1. The frame which incloses or surrounds the sides and top of a door. The separate parts are the *door-jambe*, or *door-posts*, *door-sill* and *door-lintel*, which see.

2. A partition at the end of a street-car which incloses a sliding door when open. See *Fare-wicket door-case*.

Door-case intermediate rail (street cars). 84, fig. 1844. A rail of a door-case above the window.

Door-case panel (street cars). Figs. 1848-6. A panel in a partition which incloses the sliding-door. There are two, the top-panel and seat-panel.

Door-case sash (street cars). 86, fig. 1844. A window-sash in the partition which incloses a sliding-door. It opens on hinges and is placed opposite to another in the end of the car outside of the door.

Door-case sash-button. 87, fig. 1844; fig. 1861. See *Door-button*.

Door-case seat-panel. 43, fig. 1844. See *Door-case panel*.

Door-case top-panel. 85, fig. 1844. See *Door-case panel*. In some cases a mirror is used in place of a panel.

Door-case top-rail. 83, fig. 1844. A stick parallel with the *Door-lintel*, which see.

Door centre-girth (freight-car doors). 178, figs. 98-6. A horizontal board across the middle of the door. A *middle door-rail*, except that it is not framed into the door but simply nailed on.

Door fence-rail (English). 118, figs. 204, 205. A horizontal piece of wood forming, on the outside of the door, the bottom of the window aperture. It is reinforced with a band of brass or iron against which the window sash bears when it is closed.

English carriage windows drop down to open, like an omnibus or street car window.

Door-frame. Fig. 870. The structure in which the panels of a door are fitted. It is composed, as is also a window sash, of the *stiles*, or upright pieces at the sides; the *mullions*, or central upright pieces; the *bottom-rail*; the *lock*, or *central rail*, and the *top-rail*. The *Door-case*, which see, surrounds it. See *Fire-door frame*.

Door friction-roller. Figs. 791-801, etc. See *Sliding-door friction-roller*. *Car-door hanger*.

Door glass-frame stop-rail (English). 115, figs. 204-5. In a carriage, a small horizontal piece of wood in the lower part of the door against which the window drops when opened. See *Door fence-rail*.

Door-guards (baggage and freight-car sliding doors). 77, figs. 83-5. Strips of wood which inclose the space occupied by the door to keep the freight from interfering with its movement.

Door guard-band (street cars). 86, fig. 1845. A metal band fastened crosswise on the middle door-rail to protect the door from being chafed.

Door-handle (freight cars). 78, figs. 82-96. A U-shaped

-door for passengers to take
f the car.

38. A hook-shaped piece of
door is suspended at its top,
track at the top of the door.
usually made of wrought-iron,
on, with friction rollers, or
rolls. They are also used in
cars, and are then generally
. The name of these more
only extended into *Car-door*
also *Anti-friction car-door*

fig. 1011. A metal clasp at
hich they are fastened to a
car. Used chiefly on freight-
locks.

H, fig. 1011. A projecting
aped door-hasps enters, and is
p.

79, 790, 784. See *Hinge*.

35. Three brass hinges, upper,
; the door to the body. These
htly to allow for the curvature

A device for holding a door
rms are shown in figs. 762-4,
s are often called *door-stops*,

knob is often made in various peculiar fo
knob, fig. 750.

Door-latch. Figs. 989-95, 1005-10, 1022-
ment to a door to hold it shut. See *l*
latch is often made in combination with
a separate bolt and key to secure or faste
the outside, as in figs. 987, etc.

Door-latch arbor. A *Door-latch spindle*,

Door-latch bolt. 1, figs. 987-95, 1005-24.

Door-latch hook. 2, figs. 746-9, 990-1.

sliding-door latch which engages with
holds the door shut.

Door-latch keeper. 9, figs. 746-9, 989-1
called *Strike-plate*, which see.

Door-latch rose, or escutcheon. 4, figs. 75

A plate fastened to a door as a guar
the spindle. See *Escutcheon*.

Door-latch spindle. 10, fig. 994; 750, etc.

shaft to which the door-handle or knob
by which the latch is turned.

Door-latch spring. A spring which a
hook or bolt and causes it to engage with
ally made of a flat piece of cast-steel.

Door-light (English). 138, figs. 204, 206
the window in the door which in Eng
lowered to open it like an omnibus or st

Door-light bottom sash-rail, or glass-fra
rail (English). 140, figs. 204-5. The b
door window framing.

Door-lock. 19, fig. 870; figs. 746-9, 987-95, 1005-24. See *Lock*. A *latch*, which see, is usually combined with a passenger car door-lock.

Door-lock bolt. 7, fig. 991. See *Lock*.

Door-lock keeper, or nosing. 8, figs. 987-94. See *Keeper*.

Door-mullion. 146, figs. 158-85; 2, fig. 870; 79, fig. 1845.

A vertical bar of wood between the panels of a door. See *Door-frame*. *Door-window mullion*.

Door name-plate. 3, fig. 870. A metal plate on the inside of a passenger-car door with the name of the builder inscribed on it. This is now more commonly painted on.

Door-panel. 151, figs. 158, 185; 10 and 11, fig. 870. "A piece of board whose edges are inserted into the groove of a thicker surrounding frame of a door."—*Webster*. They are distinguished as *lower*, *middle* and *upper*. Any panel, but especially the lower, is sometimes cut up into two *twin panels* by a *door mullion*.

Door-panel batten (English). 109, fig. 205. American equivalent, *furring*. In a carriage, a piece which stiffens the *door-panel*, which is pinned to it.

Door-pillar or door-stile (English). 139, figs. 204, 206. American equivalent, *door-stile*, which see. The outer sides of the stiles are beveled in a peculiar manner, so as to shut tight, and the inner sides are grooved to allow the movement of the window.

Door-pin (freight-car doors). 74, figs. 83, 87, 91. A pin used to fasten a *hasp* on to a *staple*. Lead seals are sometimes attached thereto.

Door-pin chain. 75, fig. 82. A chain by which a door-pin is attached to a car.

Door-plate. 3, fig. 870; figs. 1099 etc. A notice-plate. See *Door name-plate*.

Door-post, or door-jamb. 44, figs. 82-143; 62, figs. 155-85; 1, fig. 870; 18, figs. 1843-4. A vertical post which forms the side of a doorway.

Door-post filling-piece (passenger car framing). 35, fig. 186.

Door-post pocket. 44, figs. 82-101. See *Pocket*.

Door-pull. Figs. 752-3. A D-shaped handle attached to a door to take hold of in opening or closing it.

Door-rail. Fig. 870. A horizontal member or bar of the framing of a door. The upper one, 4, fig. 870, is called the *top-rail*; the lower one, 5, the *bottom-rail*; 6, the *middle or lock-rail*; 7, the *parting-rail*. Minor variations often occur.

Door-rail bracket (passenger car doors). 1, figs. 871-2. A bracket to carry top door-rail, serving as a guide for the door. See also *Door-track bracket*.

Door-roller. A *Door-sheave*, which see.

Door-sash. 12 and 13, fig. 870. A wooden frame, containing one or more panes of glass, placed in a door. In some cases one of these sashes is made to slide, so that it can be opened for ventilation. They are distinguished as *lower* and *upper* door-sash. The lower sash is commonly movable for ventilation and held open by a *door sash-lift* or *bolt* entering into a *door-sash plate*.

Door-sash bolt. 14, fig. 870; fig. 766. A metal pin attached to a sliding-door sash to hold it in any desired position.

Door-sash lift. Figs. 1669-70. See also above.

Door-sash plate. Fig. 767; 15, fig. 870. See above.

Door-shaft (single-platform street cars). An iron shaft extending through the car for the purpose of enabling the driver to open the rear door. A *door-shaft lever* is attached at the front end and a *door-shaft crank* at the back end, which is fastened to a slotted *door-shaft crank plate* on the door.

Door-sheave, or sliding-door sheave. 2, figs. 291-6. A small wheel on which a sliding door rolls. It is placed at the bottom of the door and sometimes at the top, also. It is carried in a *door-sheave holder*. A grooved casting called a *door-shoe* or *door-slide* is sometimes used as a substitute on freight car doors, especially when the load does not rest upon the lower door-track.

Door-shoe. 70, fig. 82. See *Door-sheave*.

Door-sill. 64, figs. 88-9, 93-4; 93, figs. 1843-4. A cross-piece attached to the floor on the under side of a door-opening. In car construction the term is usually applied to an iron plate used under passenger-car and occasionally freight-car doors, as 8, fig. 379.

Door-sill plate (English). 208, figs. 204, 205. American equivalent, *door-sill* or *door-sill plate*. A roughened brass wearing piece placed in the doorway entrance.

Door-slide. See *Door-sheave*.

Door-spindle. Figs. 999, 1003-10. The bar passing through the door which carries the door-knobs.

Door-spring. Figs. 755-7. An attachment to make doors self-closing. Three of the great numbers of devices in use are shown. They are little used in car-work, *double*

... stay the door and retain it.
... as figs. 149-151.

Fig. 71, 72, figs. 92-93, etc.
... (usually) iron to restrain ex-
... distinguished as closed door-
y.

A leather strap or cord by which
it is fast from the front plat-

Fig. 204, 205, etc. See Door-rail.

Fig. 17-130. A metal bar or guide
... and upon which it moves,
in its place. They are either top
... trucks. The former usually
freight-car doors, being hung
... The lower track serves only
doors.

Fig. 142-141, 142-140. An iron or
... to the side of a freight-car, to
... which holds a sliding-
... door-rail bracket,
... opening formed by a door-case,
...

Fig. 1445. A middle up-
... which is not fluid, used for lu-

Fig. 740-4. A device to
... way and also to make it

... abreast, a single chair being u
side of the car.

Double check-valve Westinghouse br
313. A valve, now little used, att
underneath a car, which is equipped
style straight-air (which see) and th
so that either can be used. See Trip
check (also little used). Figs. 354-7.

Double-coil nest spring. Figs. 2049-210
which see, with another inside of it.

Double-cone lamp-globe. Fig. 953. S

Double-deck stock-car. Figs. 132-8.
floors, or stories, one above the other,
hogs, etc. The intermediate floor is
floor or double deck.

Double-deck street-car. Fig. 1838. A
seats on the roof, much used abroad
U. S.

Double-door. 1. A door made in two
sometimes fastened together by hing
back on each other, and sometimes ea
to one of the door-po-ts. Such doors a
baggage and postal cars. Sliding-door
times made in two parts.

2. (Fruit car). Figs. 121-125, 130, etc.
one inside the other, as in refrigerator c
called double-doors.

Double elliptic spring. Fig. 2034. See.

Double fire-door (Spear heater). Fig. 1502.

- equalize the pressure on the two brake-beams. See *Brake-gear*.
- Double pipe-clip.** Fig. 1845. An iron band made with two bends for holding two pipes (as heater pipes) in their place. See *Clip*.
- Double-plate wheel.** Figs. 2185-6. A cast-iron car-wheel, the rim and hub of which are united by two cast-iron plates or disks. See *Car-wheel* and *wheel*.
- Double ratchet** (Morgan's deck-sash pivot). Figs. 1618-21. A pair of ribbed disks which engage with each other in any position, there being no separate dog or ratchet-bolt. Another style of double ratchet, so called from its working when the sash is moved either way, is shown in figs. 1640-4.
- Double sash-spring.** Fig. 1648. See *Sash-spring*.
- Double-spoke car-wheel.** Figs. 2162 and 2165. See *Kirtley's double-spoke car-wheel*.
- Double strap hanger** (for bell-cord). Fig. 787. See *Bell-cord hanger*.
- Double-spring drawbar.** Figs. 424-7. A form of drawbar in which two springs are used, either side by side, as in some designs not here shown, or one in front of the other, as in the Hoit draw-gear, figs. 426-7. In the latter case only one of the springs acts at once, one under tension and the other under compression. Drawbars with *auxiliary draw-springs*, which see, figs. 887-90, are still another class, which are double spring *de facto*, but not so called.
- Double-spring drawbar timber** (Hoit draw-gear). 2, figs. 426-7. Two timbers extending longitudinally from the needle-beams to the *follower plate-block*, bolted to and under the centre-sills and connected thereto with *packing-blocks*.
- Double-washer.** Figs. 1778, 1875. Also called a *twin-washer*.
- Double window-blind.** 140, figs. 155-85; 17, 18, figs. 692-3, 679-81, which see. The usual form of window-blind. They are made in two parts, so as to require less height when raised. See *Window-blind*.
- Double window-blind lift.** Figs. 1675, 1685, 1689-92. See *Window-blind lift*.
- Dove-tail.** "A flaring tenon adapted to fit into a mortise having receding sides so as to prevent the withdrawal of the tenon in the directions to which it will be exposed to strain."—*Knight*. Fig. 1977 shows one of the many forms of dove-tail joints, but it is not exactly similar to such joints in wood.
- Draft-bolt** (Janney coupler, which see). 11, figs. 542-554, 555-601.
- Draft-door** (Gouge heater). 22-3, fig. 1408½. Same as an *ash-pit door* of other heaters. Has catch, slide-bolt, etc.
- Draft-iron** (Janney coupler, which see). 112, figs. 542-54. The equivalent of a *drawbar jaw*, which see.
- Draft regulator.** Figs. 1491-2. See *Spear's draft regulator*.
- Draft-sills.** The *centre-sills*.
- Draft-spring.** A *Draw-spring*, which see.
- Draft-valve** (Harrison postal-car chandelier). E, figs. 841-2.
- Draft-washer** (Janney coupler). 31, figs. 542-554, 555-601. The washer for the rear end of the auxiliary draft-spring.
- Drain-cock.** 1. (Of engine, Westinghouse brake.) 41, figs. 298-9; 19, fig. 811. A faucet attached to the lower end of the steam-cylinder to draw off water of condensation. See also *Reservoir drain-cock*.
- Drain-cup, or drip-cup** (Westinghouse brake). 11, fig. 838. A globular receptacle under a triple valve to collect water of condensation. It is no longer used. See notes to figs. 832-3.
- Drain-pipe** (Lorenz refrigerator car). P, figs. 180-180½.
- Drain-pipe union** (Westinghouse air-pump, etc.). 41, fig. 298; 44, fig. 299.
- Drawbar.** 1. (Freight cars). Figs. 440-536; 23, figs. 83-142; 29, figs. 155-85; 1, figs. 888-400. An open-mouthed bar at the end of a car in which the *coupling-links* enter and are secured by a *coupling-pin*. They are provided with a *draw-spring*, which see, to give elasticity to the connection between the cars. Drawbars are either of cast or wrought iron, and in respect to their form are either (1) *bolt or spindle* drawbars, in which the draw-spring is attached by a bolt passing through its centre; or (2) *spring-pocket or strap* drawbars, in which the draw-spring is inclosed within a yoke surrounding it. Special forms of drawbars are the *Safford* or *open-mouthed*, and the *Potter* or *three-link* drawbars, which see. The New York Elevated Railroad uses the *centre-draft* drawbar, which see, figs. 167-8, attached directly to the centre-pin of the car. See also *Continuous draw-gear* and *Hoit double-spring drawbar*. The *solid-head* is a wrought-iron drawbar forged in one piece instead of

r couplers, figs. 408-25, which
ently called *draw-head*, espe-
some of which, as figs. 461-4,
h certain coal cars a cheap
a *draw-hook*, fig. 440, which
this style is almost universal
n links in freight-car service,
which see, for passenger cars.
stop. The drawbar of passen-
r frequently called a *coupling*-
ctangular space blocked out at
follower-plates is sometimes
ubar. See figs. 408-4. Certain
cars are, for economy, bolted
s, which see, avoiding all use

, figs. 539-541. The long bar
head (13) is attached, the two
ling. The rear portion of the
f the *drawbar side-plates* (15)

39, figs. 164-8; 1, figs. 542-4;
ed the *Janney passenger* or
sts of two parts, the *Janney* (or
head, and the *Janney knuckle*.
e *drawbar coupling-hook*, 11,

19; 7, figs. 389-99. A bolt or
drawbar to a draw-spring and

to which the ends of the draw-timbers
Drawbar distance-piece (wrought-iron
fig. 450; 4, fig. 389. A block of iron
and lower plates. In many cases it
for the rivets.

Drawbar face-plate (wrought-iron d
388-9; 3, figs. 450-536. The outer
and which bears against a similar plat
to it. When such a plate is made in
drawbar, it is called a *drawbar head*.

Drawbar follower-plates. 14, figs.
387-90. A pair of iron plates which
end of a draw-spring, and transmits th
pression on the draw-bar to the draw-
iliary drawbar follower-plate.

Drawbar friction-plate (street cars).
through which the drawbar passes, a
form end-timber, to protect it from a

Drawbar guides. 13, figs. 388-404.
which are fastened in pairs to the top
lugs or *stops* bolted to the draw-tim
forming guide- in which the *draw*
move. A *drawbar jaw*, which see,
as a substitute for both the guides ar
2. (Logging cars.) Fig. 1758.

Drawbar head (wrought-iron drawb
400. The outer end of a solid dra
against a similar head on the adjoint
from the d

bar stop, which see; or as a stop for the drawbar followers or draw-spring plates. See also *Drawbar side-casting*.

Drawbar packing-blocks. 186, figs. 98-4. A rectangular piece gained into the draw-timbers and centre-sills and serving to prevent longitudinal movement. See *Packing-block*.

Drawbar pocket (strap or spring-pocket drawbars). Fig. 450. A *drawbar spring-pocket*, which see.

Drawbar safety-lug. Figs. 469, 477, 481, 505, 527. A horn on the upper side of a drawbar to bear against the end-sill on a single dead-block on the end-sill, to relieve the draw-spring, etc., from excessive buffing strains. Little used.

Drawbar sector (centre-draft draw-gear, New York Elevated Railroads). 33, figs. 167-8. A guide for the drawbar, shaped like an arc of a circle, fastened underneath the platform.

Drawbar side-casting. Fig. 447. An iron casting, of which a pair serve as combined *drawbar guide* and *stop*, which see, for the followers to hold them in their places. A *drawbar jaw* is a wrought iron substitute and equivalent.

Drawbar side-plates (Cowell platform and coupler). 15, figs. 589-541. Two plates connected by rivets, constituting the rear portion of the drawbar.

Drawbar side-spring (Cowell platform and coupler). 17, fig. 540. A spring attached to the *stirrup*, or drawbar carry-iron, to give the drawbar the necessary lateral motion in coupling. It takes the place of the Miller *leaf-spring* or *coupling-spring*.

Drawbar spindle, or stem. 7, fig. 448; 4, fig. 449. The *drawbar bolt* which passes through the centre of the draw-spring and follower-plates in a bolt or spindle drawbar.

Drawbar spring-pocket. 1, figs. 450, 452. The space at the back end of a spring-pocket or strap drawbar which receives the draw-spring and follower-plates.

Drawbar stem. A *drawbar bolt*, which see.

Drawbar stirrup. A *drawbar carry-iron*, which see.

Drawbar stop. 17, figs. 387-9, 388-4. A casting which limits the movement of the drawbar followers, bolted to the drawbar timbers and forming distance-pieces to which the *drawbar guides* are bolted. The castings for the drawbar stop are now sometimes made long enough to bear against the body-bolster, thus relieving lugs and bolts of strain. *Drawbar side-castings*, or wrought iron

drawbar jaws, which see, are used as a substitute for both stops and guides.

Drawbar washer (logging cars). Fig. 1759. A follower-plate on a small scale.

Drawbar yoke. A *drawbar carry-iron*, which see.

Draw-chain (English). See *Wagon coupling*.

Draw-clevis (street cars). A wrought-iron bar with forked end attached to the platform, to which the horses are attached. Two kinds of these are used, one fastened to the platform so as to be immovable, the other a *spring draw-clevis*, can slide lengthwise, and its motion is resisted by a spring.

Drawer-pull. Fig. 1042. A wooden or metal attachment to a drawer to take hold of in pulling it out. In postal cars they are combined with label-holders, fig. 1077.

Draw-gear, freight. Figs. 388-400.

“ “ (M. C. B. standards). Figs. 401-406.

“ “ (automatic couplers). Figs. 409-428.

“ “ (continuous). Figs. 424-427.

“ “ (coupling links, etc.). Figs. 428-439.

“ “ (drawbars). Figs. 440-536.

“ “ (English). Figs. 116-119.

“ **passenger** (Cowell). Figs. 537-541.

“ “ (Janney). Figs. 542-553.

“ “ (Janney-Miller). Figs. 554-635.

“ “ (Miller). Figs. 636-643.

“ “ (Elevated Railroad of N. Y.) Figs. 167-168.

“ “ (English). Figs. 205-207.

Draw-gear. Figs. 338-643. A term used to designate the drawbars, draw-timbers, buffing apparatus, and all their attachments—in short, the whole of the arrangements by which a car is drawn and which resists concussions. See the various heads above. Also *drawbar*, *draw-head*, *draw-timbers*, etc.

Draw-gear tie-rod. 139, figs. 88-96, 106, 140. A rod which connects an end-sill or platform end-timber with a body-bolster or drawbar cross-timber to tie them together.

Draw-head. 1. A *drawbar* is very commonly called a *draw-head*, especially short cast-iron drawbars. See also *Drawbar-head*.

2. (Cowell platform and coupler.) 13, figs. 538-541. The pivoted head of the *drawbar*. When closed and locked with the key shown in fig. 539, the whole resem-

receives the link of a adjoining vehicle, in order to A precisely similar arrangement American coal cars. In England (goods wagons). A *screw-coupler* used on passenger cars (car-

drawbar front-plate (English). A can equivalent, *draw-hook plate*. plate secured to the *head-stock*, d receiving its rebound.

s. 52-8, 210, etc. A luxurious vel, furnished with arm-chairs, extra charge is usually made to them, and they are run by sepa- eping cars under contract with nd perhaps more commonly, *hair car*, which see; sometimes r. See *Bay-window parlor car*.

ater). Fig. 1828. A cock at- 1801, for emptying the pipes. which see.

raw-gear.) 4, figs. 424-5, 182, unites two drawbars at opposite ; the draw-timber attachments

ig. 426, and 182, figs. 94-6. The -spring 3, and *buffer-spring* 4,

at the 13th Annual Convention."

An occasional substitute for draw- gauge and other cheap cars is the *spring* see.

2. (Hoit draw-gear.) 3, figs. 426-7. under the *centre* of the car, abutting a beam, and sustaining tension strains *buffer-spring*, 4, being used at the front

8. (English.) Figs. 117, 206. A long, l reaching entirely across the car. Rul are more generally used, especially drawbars.

Draw-spring cradle-plate (English).

A longitudinal plate in the *under-frame* the *draw-spring*.

Draw-spring pocket. Figs. 450, etc. A *pocket*, which see.

Draw-spring stop. 8, fig. 389. A metal : in the centre of a spiral or volute draw excessive compression. Not to be confu *bar stop*, which see.

Draw-timbers. 10, figs. 388-400; 100, figs. 82-148; 31, figs. 155-85. A pair o ing the drawbar attachments, placed b sills, and usually extending from the *pla* of passenger cars, or the end-sill of fre body-bolster. In passenger cars these tit the principal supports of the platform *sills* and *platform*.

should not be confused with a *drawbar carry-iron*, 9, figs. 896, etc.

Draw-timber carry-iron pin. 2, figs. 891-4. The pin supporting the apex of the Λ -shaped draw-timber carry-iron. It rests upon a small casting or wrought plate.

Draw-timber carry-iron washer-plate. 4, figs. 891-4. Plates placed at the lower extremities of a draw-timber carry-iron to serve as washers.

Draw-timber guards. 11, figs. 883-400. Cast-iron lugs, or wrought plates, bolted to the sides of draw-timbers over the *drawbar carry-iron*, which see, when the latter is a mere flat strap, to resist lateral strains and protect the draw-timbers from wear.

Draw-timber pocket. 18, figs. 887-9. A casting attached to the body-bolster or centre-sills of a car to receive the end of a *draw-timber*.

Draw-timber tie-bar. 12, figs. 888-400. A transverse iron bar attached to the under sides of a pair of draw-timbers to tie them together.

Dressing-room. Fig. 208. Another name for a *saloon*, especially one provided with wash-bowl and toilet facilities. The ladies' saloon of sleeping and parlor cars is commonly so fitted.

Drilling. A term used in New Jersey for *switching*, which see, or making up trains. *Regulating* is another term sometimes used. The English term for this is *marshaling* or *shunting*.

Drip. 1. A receptacle to collect waste or superfluous liquid, as the *water-drip* of a water-cooler. See *Urinal drip-pan*, fig. 1108.

2. (Dining-car kitchens.) Fig. 193. A lower sink receiving the drainage therefrom.

Drip-cock (Westinghouse brake). Fig. 293. The cock at the bottom of the drip-cup.

Drip-coupling, or basin-coupling (wash-basin). 1-2, fig. 1573. The connection of the waste-pipe, or drip-pipe with the basin.

Drip-cup (Westinghouse brake). Fig. 293. A receptacle inserted in the brake-pipe of each car to receive water condensing therein.

2. (Student lamp.) D (or 20), figs. 852-4.

Drip-cup screw (Student lamp). E, figs. 852-4.

Drip-dish (refrigerator car). E, fig. 181. A dish or pan at one corner or end of the car for receiving the water

from the melting ice, usually permitting it to escape by a *trap*, which see.

Drip-hole (Moehring argand lamp). d, figs. 849-50.

Drip-pipe (alcove). 4, figs. 1594-4, 1600.

Drip-shield (Moehring argand lamp). e, figs. 849-50.

Drip-spout (Moehring argand lamp). f, figs. 849-50.

Drip-valve. 1. (American steam driver-brake.) 6, figs. 358-9. A form of *steam-trap*, which see.

2. (Eames ejector.) 58, figs. 282-8.

Driver-brake pipe (Westinghouse brake). 22, fig. 297. In the most recent gear this pipe is not used as shown in the engraving. See note therewith.

Driving-chain (pile-driver car). 43, fig. 1822. A *pitch-chain* (which see) used to make the pile-driver car self-propelling, by engaging with the *pitch-gear* attached to one of the axles. Such cars are not usually made self-propelling.

Driving-gear (lever hand-car). 9, 10, figs. 1724-6. It consists of the spur-wheel, or gear-wheel, and pinion.

Driving-wheel brake, or driver brake (air, figs. 295-323; steam, figs. 358-65). A brake applied to the driving-wheels of a locomotive. They are now in increasing use, but still the exception. Any of the air-brakes are or may be so applied. A steam brake, manufactured by the American Brake Co., has also been quite largely introduced, two forms of which only, the *horizontal cylinder* and *bell-crank* steam driver-brakes, are illustrated. The other forms are the *single-driver* brake and the *spring-toggle* brake, not shown by illustration. The single-driver brake uses a set of levers somewhat analogous to the ordinary brake-gear. The spring-toggle brake is very similar to the horizontal-cylinder driver-brake, figs. 858-9, but interposes a spiral spring between the push-bar and the brake-block to equalize the pressure.

Driving-wheel brake-cylinders (Westinghouse). Figs. 808-10, 814-15. (American Brake Co.) Figs. 358-65.

Driving-wheel brake-hose (Westinghouse brake). 5-3, fig. 811.

Drop (of lamp). 9, 9, figs. 828-33. "The drop of a centre lamp is its extreme length," measured from the ceiling to the lowest part of the lamp.

Drop-bottom. See *Drop-door*.

Drop-bottom car. Figs. 16-33, 39-33, 35-8, 105. A car so

the centre of the car
top-doors. See *Brake* and *brake-*

15-7; F, figs. 109-12. A door at
bottom or hopper-bottom car for
allowing the load to fall through.
, if not invariably, in pairs, and
drop-door chain wound upon a
see. A *drop-door beam* extends
the winding-shaft to assist in sup-
the car.

figs. 105, 107. See above.

figs. 105-7. 2, figs. 109-12. A
winding-shaft and the *drop-doors*,
and *hopper chain*.

fig. 105. See above.

cushions). Figs. 1213-5, etc.
the slats supporting the seat-
of the seat-rails so as to enable
to be used.

under the steam hammer by

(chens). Fig. 193. A table
to drop against it out of the way

g. 1071. A *letter-drop*, which

4, figs. 1156-7. A rack by
back of the chair is regulated.

Hammond fastening (English).

to railroad wheels, a mode of sec-
wheel, which prevents their coming
tire break or become loose. The
dotted line on the left hand of
hammered into shape shown in
securing the *retaining-ring* in po-
fastening.

Drum-shaft (of a derrick or crane).

shaft on which the winding-drum is

Drum-support (Baker heater). Fig.

the roof to hold the circulating-drum

Dual burner. Figs. 873-7. A coal-

two wicks, each in a separate tube,
flame is obtained. The *Taber* burn
a single tube.

Duck. A flax fabric, lighter and finer

use in car upholstery. It is usually
rolls 18, 24 and 40 inches wide and a
Roofing duck (used for street-car roof
of many different widths up to 12 feet
cover the roof when desired.

Dump-car. A term used to designate
and *tip cars*, which see.

Duplicate elliptic spring. Figs. 20
elliptic spring, which see.

Duplicate-hose coupling (Westinghouse)
device to guard against the danger of
see) bursting hose.

Dust-door (Gouge heater). Fig. 1418; 21, fig. 14084. A door to clean out the bottom of the case.

Duster. See *Feather-duster*. Fig. 1041.

Dust-guard. 15, figs. 2002, 2004, 2005, 2011. A thin piece of wood, leather or vulcanized fibre, inserted in the *dust-guard chamber* at the back of a journal-box, and fitting closely around the *dust-guard bearing* of the axle. It is to exclude dust and prevent the escape of oil and waste. Sometimes called *axle-packing* or *box-packing*.

Dust-guard bearing (of an axle). D, figs. 1974-8. See above.

Dust-guard chamber (of a journal-box). 15, figs. 2002-11. See above.

Dust hand-hole (street car). An opening in the *door-casing*, which see, under the seat, to give access to the space into which the door slides for the purpose of removing dirt.

Dutchman. A block or wedge of wood driven into a crevice to hide the consequences of bad fitting in construction. A kind of *shim*.

ED

Eames vacuum brake. Figs. 266-69. A system of continuous brakes, invented by Fred. W. Eames, operated by exhausting the air by an *ejector*, which see, from behind flexible india-rubber diaphragms attached to each truck. These diaphragms are directly connected to the brake-levers, and the pressure of the air on the outside of the diaphragms is thus communicated to the brake-chambers. The rubber diaphragms cover the mouth of a large cast-iron diaphragm-shell or bowl.

This brake is in use on the New York Elevated rail-roads, on which the number of stops is very great, and several other lines. The advantage of the plan is its simplicity. The disadvantage, especially for high-speed trains, is that it does not act so quickly as the Westinghouse automatic.

Eave. A general name for projections of wood, metal or other exterior parts so attached, and more especially applicable to projections intended for exterior attachment. See *Eave-jamb*, fig. 1085, etc. Also *Eave-board*, below.

Eave-bail fastener. Figs. 315-4. An attachment for

of wire connected with the wire guard, to which the bail is attached instead of to the body of the lantern.

Eastlake style. A style of ornamentation consisting of lines intended to indicate structural features, or minor ideas appropriate to the construction. The expression is also loosely applied to any style of construction where the framing is exposed to view, and made intentionally strong. It had its origin in Charles L. Eastlake's book, "Hints on Household Taste," Queen Anne style, which see, is an entirely different thing, though the two are often improperly confused.

Eastman heater car. See *Heater car*.

Eaves fascia-board. 1. (Freight cars.) 60, figs. 49 60. A plain board connecting the sheathing with the roof.

2. (Passenger cars.) 60, figs. 190 41. A projecting board on the outside of the lower deck, immediately under the eaves, which comes below and under the *eaves-moulding*.

Eaves-moulding. 1. (Freight cars.) 60, figs. 43 44. A plain strip sometimes used inside an *eaves fascia board*, which see.

2. (Passenger cars.) 60, figs. 193 40. An ornamental finish to the exterior angle of the lower deck, installed and above the *eaves fascia-board*. A similar *deck cornice moulding* is used for the upper deck.

Eccentric-lever (Westinghouse driving-wheel brake), 18, figs. 322-3. An arm consisting of an eccentric lever, cast in one piece, or of two eccentric levers, one of which is attached to a brake band and the other connected with the pistons of the eccentric-lever linkage. The end of the casting is made of a cast-iron or steel, and is provided with a flange, which is attached to the end of the axle. The lever is pivoted to the axle, and the other end of the lever is connected with the pistons of the eccentric-lever linkage. The lever is pivoted to the axle, and the other end of the lever is connected with the pistons of the eccentric-lever linkage.

Eccentric-lever linkage. 18, figs. 322 3. See above.

Eccentric-lever wheel. 18, figs. 322 3. See above.

Eccentric-lever wheel. 18, figs. 322 3. A wheel which is pivoted to the axle, and the other end of the lever is connected with the pistons of the eccentric-lever linkage.

Eccentric-lever wheel. 18, figs. 322 3. See above.

Eccentric-lever wheel. 18, figs. 322 3. A wheel which is pivoted to the axle, and the other end of the lever is connected with the pistons of the eccentric-lever linkage. The lever is pivoted to the axle, and the other end of the lever is connected with the pistons of the eccentric-lever linkage.

und disk fast-
e. See Win-

3. A spring
Spiral spring.
mp-globe.

sembling an egg
s a *cast-iron*
etc., where

See *Spiral*

43, 98. The
nsisting of a
ucks (both of
nbers of four-
box cars are
parlor and
teen-wheeled
in America
ified.

for operating
ing" air. It
placed in the

ferent substances are used, such as paper, wood, india-
rubber, oakum, etc. The only wheel especially so named
is the *Cooper elastic wheel*. Nearly all English passenger
wheels are made of teak wood (figs. 2151-8) to effect this
purpose.

Elbow. Fig. 1334. A short L-shaped cast-iron tube for
uniting the ends of two pipes, generally at right angles
to each other. See also *Cold-air elbow* and *Inlet elbow*
(Gouge heater).

Elbow-rail (English). 108, fig. 205. In a carriage, a part
of the body framing running horizontally along the sides
at about the height of the elbow of a passenger in a sitting
position.

Elbow-rest (English). See *Folding arm-rest*. *Side arm-
rest*.

Elder brake. Fig. 234. A brake for eight-wheeled cars,
with a horizontal *centre brake-lever* in the middle of the
car connected to the brake-shaft, having a fixed fulcrum
under the car body and pulleys at each end, over which a
chain passes. The *live lever* (which see) of each truck also
has a pulley or *brake-lever sheave* at its end, over which
the same chain runs to apply the brakes.

Electric lighting. Various plans for the lighting of cars
by electricity have now (1884) been tested with promise.

ness of the spring-band. The connection between the two halves of the elliptic spring at its extremities is termed the *scroll*. Elliptic springs in service are termed double or *duplicate*, triplets or *triplicate*, *quadruple*, *quintuple*, *sextuple*, etc., according to the number of springs used side by side and connected by a single eye-bolt so as to constitute practically one spring. In passenger-car service elliptic springs are usually triplicates, quadruples or quintuples. The *length* of the spring is the distance from centre to centre of scrolls when unloaded, and the *height* the height over all unloaded.

Ely, Cloud & Wall refrigerator car. Figs. 181-181½. One of the class of refrigerator cars which carry the ice in a horizontal box at the top of the car. See *Refrigerator car*. Invented by Theodore N. Ely, John W. Cloud and E. B. Wall, and patented in 1888. It is to some extent a compromise between the *Ridgway* and the "Diamond R" refrigerator cars.

Emigrant-car cook-stove. Fig. 1488. A form of car stove used only on emigrant cars, designed for cooking or heating food as well as for warming the car. For sizes and weights see fig. 1488.

Emigrant car-seat (for day car). Fig. 1148. (For sleeping car.) Figs. 685, 1149-53.

Emigrant sleeping car. Figs. 195-208. A cheaply finished car without springs or mattresses, but in other respects similar to ordinary sleepers, for the use of emigrants. Now used chiefly on the long runs west of Chicago, and to some extent used for ordinary travel, especially by parties of excursionists.

Empire car-roof. Figs. 667-9. See *Car-roof*.

Enclosed step (street car). 3, fig. 1842. A step which is covered or enclosed by a sheet-iron apron attached to a swinging door to prevent persons from riding on the step.

End arch-rail (English). 99, figs. 205-207. American equivalent, *end-plate*. A piece of timber run across the upper portion of the end of the body, its upper side being cut to the curve of the roof which it supports.

End ascending-step (English). 174, figs. 205-7. See *Ascending-rail*.

End berth-rest, or single berth-rest (emigrant sleeping berths). N, figs. 682-5. So called in distinction from the regular (double) berth-rest used on the berth-posts in the body of the car.

End-board (English). 68, figs. 116-119. American equivalent,

lent, end-plank. A plank in the end of a "goods wagon" or gondola car.

End body-brace. 35, figs. 85, 91, 96, 104. See *Body-brace*.

End body-brace pocket. 35, figs. 82-101. See *Pocket*.

End-body brace-rod. 34', figs. 98-6; 51', figs. 164-8. See *Brace-rod*.

End-brace tie-rod. 175, figs. 98-6. (Erroneous reference. No such part shown.)

End-carline. 54, figs. 184½-4. A carline (which see) at the end of a car-body. See also *End-plate*. *Platform roof end-carline*.

End-door (box cars). Fig. 2. A door sometimes inserted to afford means for the insertion of long pieces of freight or lumber that cannot be entered by the main side-doors.

End counterbrace (passenger car framing). 166, fig. 159. More commonly, simply *counterbrace*. A brace in the side of a car-body, between its ends and the body-bolster. See *Counterbrace*.

End compression-beam (passenger car framing). 169, fig. 159. A timber directly above the sills over the body-bolster against which the *compression-beam brace* and the *end counterbrace* abut. The *compression-beam* proper is situated at the middle of the car directly under the window-sills. The end compression-beam is sometimes omitted, as in figs. 644-645.

End door sash-bolt. Fig. 1670. See *Sash-bolt*.

End door sash-lift. Fig. 1669. See *Sash-lift*.

End face-plate. 1. (Janney coupler.) 8, figs. 542-555. The wrought-iron plate on the nosing of the Janney platform.

2. (Janney-Miller coupler.) 46, figs. 542-554, 555-601. See above.

End-frame (of a car-body). The frame which forms the end of a car-body. It includes the posts, braces, end-rail, end-girth, etc.

End-girth. 50, figs. 82-92, 132-138 (which see). A girth in the end of a box-car.

End-girth tie-rod. 51, figs. 84-5, 89, 91, 93, 96. A rod extending across the end of a freight-car body along the end-girth, from one corner-post to the other.

End grab-iron. 102', fig. 98. See *Grab-iron*.

End half-longitudinal (English). 6, figs. 116, 119 and 206. American equivalent, *intermediate sill*. A part of the *underframing* extending from the cross-bearer to the *headstock*.

f the train. See also *Side lamp-*

r). Fig. 1429. The lining for the
forming the air-chamber.

See *End-stanchion*.

157-188. A panel at the end and
enger or street car *below* the win-
stinguished as *lower* and *upper*.
In passenger cars distinguished
longside of the window, and *end-*

p. 207. A panel in the outside
riage, extending from the arch-
iece.

-frame). 17, figs. 1942-7, 1956-
or bar of iron by which the
pieces of a truck-frame are con-
ked *end-piece* is one cut away on
ar. The *inside end-piece* is the
f the car, in distinction from the

figs. 205-7. An upright post in

car). 197, figs. 118-5. They
car-floor so as to drop down

, 182-8. A timber across the
r and which is fastened to the
ually made of the

and roof-panel. 11, fig. 186. The pa
and below the clear-story.

End scroll-iron (English). 89, fig. 201
support for the *spring-link adjusting-*
face is attached to the under side of t
lower part is bored horizontally for th
It is placed near the end of the vehicle
somewhat in pattern from the ordinar

End seat-panel (street car). 43, fig. 184
at the end of a longitudinal or side sea

End-sill. 2, figs. 82-124, 155-85. The r
verse timber of a car-body into which
bers are framed. In passenger cars
under the door, the *platform* (which s
ous parts) being a separate constructi
sill, which see, is sometimes added out
sill proper as a substitute for a draw-
land the end-sill is termed the *head-sto*
cars, as A⁴, figs. 144-9, a wooden end-
used, and bolted to an *end-sill channel-b*
iron sills are connected, and which is t
End-sill brackets (of iron frame cars).

L-shaped angle-plates used to connect t
the end-sill channel-bar. In bridge bu
are termed *brackets*. When of triang
are termed *gussets*.

End-sill channel-bar. A⁴, figs. 144-9.

End-stanchion, or end-muntin (Englis
119. An upright bar at the end of a

End-timber. See *Platform end-timber* or *buffer-beam*, also *end-sill*.

End truss-plank. 32, fig. 186. See *Truss-plank*.

End-ventilator. 142, fig. 158. An aperture for the admission or escape of air at the end of a car, usually placed over the windows. See also *Deck end-ventilator*, and the *end-ventilator* for fruit car, figs. 121-125.

End ventilator-opener. Figs. 1604-17. See *Deck-sash opener*.

End wainscot-panel. 28, fig. 186. See *Wainscot-panel*.

End window-panel. 71, fig. 157. A panel at the end and on the outside of a passenger car *alongside* of the window, in distinction from the *end-panel* proper, which is below the window.

Engine and air-pump complete (Westinghouse brake). Figs. 298-9, 304-6. A machine attached to a locomotive for compressing air. It consists of a *steam* and an *air-cylinder*, the pistons in which are connected to the same piston-rod, so that the *air-piston* is worked directly by the *steam-piston*. Suitable valves are provided for admitting and exhausting the steam and air to and from the cylinders. See *Reversing-valve*, etc.

Engineer's brake-valve (Westinghouse brake). Figs. 294, 334. The valve now used instead of the old three-way cock, figs. 318-9, for applying and releasing the brakes. It differs from it in permitting more delicate graduation of the force with which the brakes are applied.

English first-class carriage. Figs. 204-207. See *Carriage* and *first-class carriage*.

English wagon. Figs. 116-120. See *Wagon* and *van*.

English wheels. Figs. 2151-80. See *Steel-tired wheel*. *Mansell wheel*. *Teak-wood centre-wheel*.

Equal-bar nest-spring. Fig. 2061, etc. A nest-spring of any number of coils, each bar of which is, or is supposed to be, of the same total length, so that the resistance of each coil may be more nearly equal. The name means little. See *Spiral spring*.

Equalizer. 1. A short term for an *equalizing-bar*, which see.

2. (Cowell coupler.) 2, fig. 538. See *Rock-lever*.

3. (Janney coupler.) 6, figs. 542-554. The bar connecting the two buffers and having a bearing against the *centre-buffer spring*.

Equaliser-block. 207, figs. 97-101. See *Brake-equalizer block*.

Equaliser-guides (Janney-Miller coupler). 47, figs. 542-554; 49, figs. 542-554, 555-601. Cast-iron chafing-plates bolted to the main knees of the Janney platform, above and below the equalizer.

Equalizer-spring. 79, figs. 1955-69, 2067, 2092. A spring which rests on an equalizing-bar and carries the weight of a car. Single or two-group spiral springs are generally used for this purpose. Rubber and volute springs are practically out of use.

Equalizer-spring cap. 72, figs. 1955-69. A casting on top of the spring, which bears against the under side of the wheel-piece and holds the spring in its place.

Equalizer-spring seat. 73, figs. 1955-69. A casting which sets on an equalizing-bar and on which the spring rests. See *Spring-plate*.

Equalizer-strap. 208, figs. 97-101. See *Brake-equaliser strap*.

Equalizing-bar (passenger car trucks). 71, figs. 1955-69, etc. Commonly abbreviated into *equalizer*. A wrought-iron bar which bears on top of the journal-boxes, and extends longitudinally from one to the other. *Equalizer-springs* rest on it between the two boxes. It is used to transfer part of the weight on one wheel to the other, and thus equalize it on both; hence its name. Equalizer-bars are sometimes used to connect the ends of semi-elliptic springs, as in figs. 102, 1959.

Equalizing-bar pedestal (four-wheel caboose cars). 164, fig. 102. A casting serving to give a fulcrum to the centre of an equalizing-lever.

Equalizing-bar seat. 17, figs. 2002-3. The surface on top of a journal-box on which an equalizer rests.

Equalizing brake-lever. A *floating-lever*, which see. The centre brake-lever, 209, figs. 97-101, is also, with little propriety, so called.

Equalizing lever. An *equalizing-bar*, which see. A *floating-lever* is also called an equalizing-lever.

Equalizing-valve (Westinghouse brake). A valve for use on long trains to equalize the pressure in the brake-pipe and prevent the inequality of pressure in the front portion of the pipe during the brief period in which the brakes are being applied by release of air from the brake-pipes, from tending to first apply and then immediately release the brakes on the forward cars, owing to the rush of air from the rear portion of the train.

Escutcheon. 1. Figs. 1000, 1002, 1025; 4, figs. 1176-7. A

similar plates
spindles pass
commonly rose.
plate is often
hole.

ing post pro-
astumblers.
rted, each of
omes exactly
ting revolu-

h escutcheon-

1. See *Es-*

Seat-spring.

ntilator.

Ventilator.

en-sided car,
ss it, largely
resorts near

vent at fixed

Expanding collar (for lamp). Fig. 910. One used to enable a larger-sized burner to be used. See *Collar*.

Expansion-drum (Searle heater). Figs. 1484-5. An equivalent in all essential respects to the *circulating-drum* of Baker heater, which see.

Express car. Figs. 59-65. A car for carrying light packages of freight for express companies on passenger trains. Also see *Combination baggage car*, fig. 58.

The express business was originated in 1839 by William F. Harnden, who traveled for some time as a messenger between New York and Boston; but it was not for a long time thereafter that it grew to sufficient dimensions to require separate cars. Alvin Adams, founder of the Adams Express Company, began business in 1840. At present complete trains of express cars are occasionally required.

Express hand-car. Fig. 1711. A hand-car with large wheels to run at a high speed. Several different designs exist not called by this name, but accomplishing, or seeking to accomplish, the same end. See *Hand-car*.

Extensible car-step. A form of step for passenger car service recently introduced, but not in general use, by

Check-chain eye.

Coupling-pin-chain eye.

Switching-eye.

Truck check-chain eye.

Eye-bolt. 1. Figs. 1797, 1872. "A bolt having an eye or loop at one end for the reception of a ring, hook, or rope, as may be required."—*Knight*. See *Bolt*; also

Brake-beam eye-bolt.

Brake safety-chain

eye-bolt.

Lock eye-bolt.

Lock-chain eye-bolt.

2. For *Miller hook* (Janney-Miller coupler). 66, figs. 542-554, 602-85. The part by which the swivel connected to the uncoupling lever is secured to the Miller hook. It is a $\frac{1}{2}$ in. bolt.

3. For *side-spring* (Janney-Miller coupler). 67, figs. 542-554, 602-85. The eye-bolt by which the side-spring stirrup is secured to the horn. It is a $\frac{1}{2}$ in. bolt.

4. (Of a wrecking car). 1, figs. 77-78. A bolt placed in the centre of the floor for attaching the hook of the hoisting gear, to keep the boom steady when the car is in motion.

Eye-bolt link-hanger. Fig. 2118. A special form of *swing-hanger*, which see, having a very short link attached to an eye-bolt passing through the transoms.

Eye-bolt nut (of engine signal-valve, West. train signal app's). 14, fig. 690.

Eye-head coupling-pin. Figs. 436-7, 445. So called in distinction from a *solid-head* or *bent-head coupling-pin*.

Eyelet. 1. Figs. 802-804. "A short metallic tube, the ends of which are flanged over against the object through which it passes. Used as a bushing or reinforce for holes."—*Knight*. In metallic eyelets of the usual form, the two halves which when compressed together form the eyelet are known as *grommets*. See *Carpet-eyelets*.

2. (Window-shade.) 3, fig. 1688. A slot in the window-shade leather to fit over the sash-lift, to hold the shade fast.

Eyelet-nail. Fig. 805. A wire nail with turned knob, for use with carpet eyelets.

Eyelet shackle car-seal. Figs. 1118-5. See *Car-seal*.

F

Face (of rim of car-wheel). 24, fig. 2002. The vertical surface of the outside of the rim.

Face-plate. 1. A metal plate by which any object is covered, so as to protect it from wear or abrasion. A *journal-box cover* is sometimes called a face-plate.

See *Berth-latch face-plate.*

Buffer-block face-plate.

Dead-block face-plate.

Drawbar face-plate.

End face-plate.

2. ("American" steam driver brake). 14, figs. 363-5; 9, figs. 358-9. The means by which the cylinder is attached to the frame of the engine.

3. (Steel-tired wheels.) Figs. 2168-4, etc. The plates connecting the tire and hub, and bolted to each. They are distinguished as *front* and *back face-plates*.

4. (Wolfrath comb. sash-lift and lock.) H, figs. 1700-2.

Facing. "A covering in front for ornament."—*Webster*
See *Deck-sill facing*.

Faggoted axle. See *Axle*. *Car-axle*.

Fall (hoisting tackle). That part of the rope to which power is applied.

Fall and tackle. Another name for *block and tackle*, which see.

Falling-door, or flap-door (English). 70, figs. 116, 117 and 119. In a *gondola car* (*open wagon*), a door opening downwards and outwards, the hinges being on the lower side. It is generally arranged as shown, but is also made to open up to the top of the side, or to extend the whole length and depth of the side.

Falling-door latch (English). 79, figs. 116-9. A latch which automatically secures the falling door when elevated into a closed position.

Fall-under, or turn-under (English). 116, fig. 207. The distance which the bottom of the body curves in from a vertical line let fall from the sides or ends.

Fare-box street car. Fig. 1836. A street car in which the fare is deposited by the passengers in a box under the observation of the driver. They usually have an inclosed platform in front, and are entered only from the rear. They are turned around at the end of each trip, either on a turn-table or (rarely) on their own truck, and run without conductors.

Fare-wicket (street cars). 89, fig. 1845. An opening in the door for collecting fare or making change.

Fare-wicket door-case. 90, fig. 1845. See above.

Fascia-board. See *Eaves fascia-board*. *Inside-cornice fascia-board*. *Inside-cornice sub-fascia-board*.

Fascia-moulding (English). See *Wrought moulding*.

Fast berth-hinge. Fig. 1239. See *Berth-hinge*.

... etc. See *Hinge*. So from a loose-joint butt-hinge or

3, 846-70. One which cannot be de-
a *plastered globe*. See *Lamp-globe*.
602. A synonymous term with
iller definition.

1594, etc. A *water-alcove*, which

041.

er). Figs. 1484-5. A cock in the
upplying brine to the pipes. Also

er). Fig. 1814; 13, fig. 1801. A
erture giving access to the fire-
s) magazine. See also *Fire-door*.
r heaters are (Gouge heater) fig.
F, fig. 1474; (Searle heater) figs.
fig. 1859. It is surrounded by a

heater). Fig. 1419.

l heater). Figs. 1836-1404. An-
ike *feed-door frame*. In the Bis-
terior exterior feed-door frame, figs.
Chute is a corruption of *shoot*.

l heater). Figs. 1870, 1898.

r heater). Fig. 1815.

re heater). Figs. 1451, 1415. A
ed-door, leaving an air-space be-

air from the main reservoir.

Felt-edge (for car-seats). Fig. 1225
up the edges of car-seat cushion;
stitched-roll generally used. It is
stitched in such a manner as to fit
tacked down it forms an even elas
Female centre-plate. The body a
are sometimes called male and fe
tre-plate.

Female gauge. An *external gauge*

Fender. See *Door-fender* (street car

Fender-board. 7, fig. 686. A board
senger-car steps to prevent mud
thrown on them by the wheels. Mo
board. The *splash-board*, if used,
of the steps.

Fender-guard. 22, figs. 1843-6. See

Fender-rail (street-car bodies). 21,
tudinal exterior rail between the bel
to which an iron panel called a *fen*
to protect the panels from contact

Ferry push-car. Fig. 72. A very lc
for pushing or pulling other cars or
when the latter is approached by a
locomotives, so that the latter ca
cars without running on the inclin

Fibre-packing. See *Elastic-fibre jou*
waste.

Filler (for Window heater). 7, 8

timber which has no other structural purpose than to close a gap.

Filling-tube (Moehring argand lamp). I, fig. 849-50.

Filling-valve (Pintech gas-lighting apparatus). A, fig. 818, also figs. 818-19. More properly, *recipient filling valve*, which see.

Finger-plate (Wolfrath sash-lift and lock). N, figs. 1700-2. Corresponds to the *trigger* of a sash-lock, which see, and subserves the same end, but is connected with the sash-lift.

Finishing varnish (painting). An elastic (oily) varnish applied in two coats. The first is allowed at least 48 hours to dry. The second and fuller coat of the same varnish is then applied and the car is kept out of the sun, but exposed to the air for a number of days. A first-class job can be turned out in 12 or 15 days, hardly in less time if a durable finish is desired. Additional time between coats will give additional safety. See *Painting*.

Fire-box (Gouge heater). 52, figs. 1418-4, etc. The various parts are the top, bottom, two ends, back lining, back of heater-case, etc.

Fire-chamber (Bissell heater). Figs. 1380-1401. More commonly termed in other stoves the *firepot*. It is in three parts, termed *top*, *middle* and *lower sections*.

Fire-door. 1. (Johnson heater.) 12-13, fig. 1472. A *feed-door*, which see. There are two, *outside* and *inside*.

2. (Spear heater.) 17, figs. 1486-90, 1502-5.

Fire-door frame (Johnson heater). 14, fig. 1472. (Spear heater.) 18, figs. 1486-90, 1504.

Fire-extinguisher. Fig. 1044. See *Babcock fire-extinguisher*.

Fire-guard, front (Johnson heater). 8, fig. 1472.

Fire-pot (Baker heater). Fig. 1805; 4, fig. 1801; (Gouge heater) 15, figs. 1405-7; (Kohler stove) A, fig. 1474; (Spear heater) figs. 1498, 1519; 12, figs. 1486-90; (Winslow heater) B, fig. 1536. Also called *fire-chamber*, *fire-box*, *furnace*, and sometimes *cylinder*.

Fire-proof bottom (Spear heater). Fig. 1534. A plate with circular corrugations, placed inside of the bottom-plate, on top of the floor.

First-class car. Figs. 48-9, 62-3. The ordinary American day coach used by the great bulk of short trip passengers. So called to distinguish it, on the one hand, from those of an inferior grade, as *emigrant* and (rarely) *second-class cars*, and on the other hand from *sleeping* and *parlor cars*

(which see), in which an extra charge, in addition to the ordinary fare, is made, and which are the true American first-class cars.

First-class carriage (English). Figs. 204 to 207. Nearest American equivalent, *parlor*, or *drawing-room car*. A coach for passengers paying the highest rate of fare. It is divided into four or more compartments, each about 7 feet cube, and seating six or eight passengers.

Fish van (English). A covered vehicle adapted to run on passenger trains, and fitted to carry fresh fish in crates or boxes. When without a roof it is termed a *fish truck*.

Fittings. Figs. 696-1707. *Furnishings*, which see.

Five-group spiral spring. Figs. 2078-2099. See *Spiral spring*.

Fixed brake-lever. 5, figs. 888-9, etc. More commonly, *dead-lever*. A brake-lever, the upper end of which is fastened to a brake-lever stop or dead-lever guide.

Fixed or stationary freight-car lock. Figs. 1014-7, 1108-9. A lock which is attached to the side of a car. The bolt or hasp is fastened to the door.

Fixed grate (Gouge heater). 2, fig. 1407. A square grate with a large circular opening for the *movable grate*.

Fixed hanger (bell-cord). Figs. 732-3, 743. See *Bell-cord hanger*.

Fixed ratchet (in Morgan's deck-sash pivot). Figs. 161

21. The piece attached to the side of the window frame with which the sash-ratchet engages, the latter being pressed against it by a spring.

Flag-holder (for corner-post of passenger car). A cast or malleable iron receptacle for a signal-flag staff. It has a lug cast on it which engages into a *flag-holder plate* attached to the corner-post. See also *Coolbaugh's lantern and flag-holder*, figs. 987-8, and *tail-light*.

Flag-holder plate. 161, figs. 169, 179, 181. See below.

Flange. 1. (Of bell-cord guides, etc., etc.) Figs. 720-24. A projecting rim for attaching the part to any surface by wood screws.

2. (Of a car-wheel.) 26, fig. 2002. A projecting edge or rim on the periphery for keeping it on the rail. The inside edge of the flange which connects with the tread of the wheel is termed the *throat*, and the extreme outer point the *toe* of the flange. Worn flanges having flat vertical surfaces extending over $\frac{1}{2}$ inch from tread of wheel, or less than 1 inch thick, are a cause for rejection

The standard Association, surface, is 4
Flange gauge
Wheel-centre

of the M. C.
 of the wheel,

flange brake-

C, fig. 1005.
 96. A gauge
 ance between
 ons shown in
 rd by the M.

) E, fig. 2167.
 ater entering
 e hold on the
 ustaining no

7.

and no pin is used to hold the latter in place, as represented.

Flexible car window-blind (Wilson's, which see). Figs. 1645-7, 185a. The *Paul flexible window-blind* is another style accomplishing the same end in a different manner. It uses slats with alternate concave and convex edges, united by a strip of spring-brass. A pair of spring-brass wires connect the slats in the middle.

Flexible frame (logging and other cheap cars). Figs. 1729-30. A frame so constructed that the natural spring of the wood may serve in part as an equivalent for metallic springs, the latter being dispensed with. Many narrow-gauge freight use *spring end-sills*, which see, in a similar manner.

Flexible-top seat-cushions. Figs. 1205-7, 1212-13. A seat-cushion, the top of which is in detached parts so that one part can yield without carrying down the other.

Floating connecting-rod (Hodge brake). 8, fig. 235. A horizontal rod which connects the two floating-levers together.

2. (Westinghouse brake.) 8, fig. 325. A rod which connects a cylinder-lever with a floating-lever.

Floating-lever (Hodge brake). 7, fig. 225; 12, fig. 225.

spectively the *flooring*, *intermediate floor* and *deafening ceiling*, the latter being on the under side of the sills. An intermediate, or *upper floor*, more commonly called the *double-deck*, is used in stock cars for carrying sheep and hogs. Hopper-bottom cars have an *inclined floor* subdivided into inclined *end-floor* and *side-floor* when both are used, which is not usual. This floor is now often made of iron plates called *hopper-plates*.

Floor air-inlets (Lorenz refrigerator car). F, figs. 180-180½.

Floor-beam. A *sill*, which see.

Floor blocking-strip (box cars). 205, figs. 97-101. A strip of approximately triangular section nailed between the posts along the floor, to which the inside lining is attached.

Floor-frame. The main frame of a car-body underneath the floor, including the sills, body-bolsters, needle-beams, etc. In England called the *under-frame*.

Floor-furnishings. Figs. 802-811.

Flooring. Tongued and grooved (which see) boards of which a passenger car floor is made. The floor of freight cars is commonly two-inch *planking*.

Floor-mat. Figs. 806-7. A texture or structure of hemp, cocoa-fibre, rattan, india-rubber, wood or other material, laid on the floor of a car for passengers to clean their boots and shoes on. Mats are placed on the floors of street cars to take up the dirt and dust. See *Cocoa-fibre*. **Wood floor-mat.** *Rubber floor-mat.* The latter are either *perforated* or *corrugated*.

Floor-pipe (for closet-hoppers). Figs. 1067-89. A pipe passing through the floor of the car only, with which the hopper proper is connected.

Floor-stop. 1. (For door-holder.) Figs. 764-778. A catch for a door-holder attached to the floor, in distinction from a *partition-stop* attached to the wall or partition. See *Door-holder*.

2. (Grain-door.) g, fig. 878.

Floor-timbers. 3, 4, figs. 82-92, 102-8, 142-3, 155-85; 10, figs. 1848-6. The main timbers in the frame of a car-body underneath the floor, and on which the latter rests. They are chiefly the *sills* (side, centre and intermediate) and the *end-sills*. The English term is *under-frame*. See also *Diagonal floor-timber*. *Inclined floor-timber*. *Transverse floor-timber*.

Floor-timber braces. 8, fig. 108; 7, figs. 170, 183. Diag-

onal timbers let into the sills under the floor to stiffen the floor-frame laterally.

Floor-timber distance-block. 7, figs. 106-7, 148; 5, figs. 170, 182. A short transverse piece of timber placed between adjoining floor-timbers and sills to stiffen them, the whole being fastened together with bolts. The floor-timber distance-blocks sometimes (as A, fig. 122) constitute collectively in connection with a *cross-frame tie-bolt* a substitute for a cross-frame tie-timber or needle-beam for stiffening the floor of the car. In iron frame cars, *tie-plates* are riveted across the top of the sills to subserve the same purpose, as C, fig. 147.

Floor-traps (refrigerator car). M, figs. 180-180½.

Floor-tubes (Gouge heater). Fig. 1439. Small tubes through the bottom of the *running-pipe* and floor at 66, fig. 1470, to prevent dust accumulating in the running-pipes.

Flue (suspended heater). E, figs. 1529-82. For hot air. See *Hot-air pipe*, etc.

Flush bolt. Figs. 761, 997. A bolt attached to a slide which is let into a door, sash, or window, so as to be flush with its surface. A *spring flush-bolt* is commonly called a *cupboard-catch*.

Flush-bolt keeper. A, fig. 997, etc. A plate which is attached to a door, sash, or window frame, and has a suitable hole in which a flush-bolt engages. When for spring-bolts, as in the engraving, they are also called *strike-plates*.

Flush-catch. Figs. 1628-9.

Flush-handle. Figs. 990, 996, 746, 761. A handle for a lock or latch which is placed in a recess, as of a door, sash, or berth, and which does not project beyond the surface of the object to which it is attached.

Flush sash-lift. Fig. 1667. A metal plate with a recess, to take hold of, which is let into a sash so as to be flush with its surface.

Fluted-glass lamp-reflector. Fig. 844. A cheap reflector for street and narrow-gauge cars.

Fogg's upper-berth hinge. Fig. 1240. See *Berth-hinge*.

Folding arm-rest, or elbow-rest (English). 198, figs. 204, 205, 206. A wooden support for the elbow, upholstered on both the upper and lower sides, and fitted with a spring hinge, so that it can be turned up to lie flat against the back of the seat, in order to allow a passenger to lie down at full length on the seat.

der.) 99, figs. 542-554, 602-35.
e.

) A common abbreviation for
holds on the packing-rings of

follower-bolt. See *Piston*.

Miller coupler). 100, figs. 542-
cars.) Fig. 1777. A *drawbar*

A *drawbar stop*, which see.

er-spring follower-plate. *Draw-*
ston follower-plate. The word
nitted from these names.

uffer-spring block (Hoit double-
igs. 426-7; 183, figs. 113-5. A
ont of the *double-spring draw-*
hich the *buffer-spring follower-*

cars.) See *Brake-step*.

nd *lower*). 172, figs. 205-207.
(street cars only) *longitudinal*
steps running along the sides of
the *upper* a short distance below
bove the level of highest station
out 18 in. from the rail level.
vent any person falling between
orm. American *excursion cars*,
ve a single foot-board, often so

ger occupying the next seat, or n
if desired. Another style is an *ad*
1194, sliding on rabbit pieces. A p
foot-rest is usually termed an *ottom*

2. (Hartley chair.) 2, figs. 1154-
the chair, consisting of two leav
carried within the *foot-rest frame*
below by a *foot-rest carrier*. The li
the arc of a circle, and its position
adjusting-lever 15. Some of the ch
foot-rest 5 and 6, fig. 1157, for the b
of the chair in the rear.

Foot-rest carriers. 9, figs. 1120-58.

Foreign car. Any car not belongi
railroad on which it is running,
which see. By the established rule
traffic all such cars are, or are sup
before entering on the lines of a for
"if an accepted foreign car is inj
shall be repaired by and at the exp
in possession thereof as promptly
cars." The cost thereof is somet
owner of the car and sometimes
elaborate system of rules revised a
Forked hanger ("American" horiz
brake). 7, figs. 838-9. The sus
brake-blocks.

Foster rim night-latch. Fig. 1
somewhat similar to the Yale lock

closing communication between the brake-cylinder, reservoir and brake-pipe.

Four-wheel car. Figs. 4, 19, 28, 41-2, etc. The original type of railway vehicle, still almost universal in England and on the Continent, and very largely used in this country for coal cars, and to some small extent for box cars and gondola cars. The truck of an ordinary American eight-wheel car is simply a four-wheel car carrying half the weight of the car-body as a dead load upon it.

Four-wheel trucks. Figs. 1907-48.

Frame. 1. The outline or skeleton upon which a structure is built up. In a car the framing is usually supposed to mean the side frame as distinguished from the floor-frame, unless otherwise so expressed. The leading types of freight-car frame are shown in figs. 84, 89, 93, 97, 121, etc. See *Bastard Howe*. *Bastard Pratt*. The leading styles of passenger car framing are shown in figs. 155, 177, 159 and 64-5, and also in perspective view, fig. 186. The plan of floor-framing, fig. 648, is wholly special to street cars. An example of the increasing use of iron in framing is the *Challender truss*, fig. 185b, which is a plate girder taking the place of the ordinary truss-rods, body-braces, truss-planks, etc.

2. (Of a door, ventilator, window-sash, mirror, etc.) The rectangular or curved border surrounding or inclosing it.

See <i>Berth-spring frame.</i>	<i>Lever-frame.</i>
<i>Continuous truck-frame.</i>	<i>Match-striker frame.</i>
<i>Cushion-frame.</i>	<i>Mirror-frame.</i>
<i>Door-frame.</i>	<i>Name-panel frame.</i>
<i>End-frame.</i>	<i>Register frame.</i>
<i>Fire-door frame.</i>	<i>Signal-bell frame.</i>
<i>Grate-frame.</i>	

Framed spring-plank. Fig. 2029. A spring-plank composed of several different pieces framed together.

Franklin Institute system of screw-threads. The *Sellers* system of screw-threads, which see, is often called the Franklin Institute system because the former was first proposed in a report to, and was recommended by, the Franklin Institute.

Freight barrow-truck. Figs. 1903, etc. More commonly supply *freight-truck*, which see. See also *Barrow-truck*.

Freight car. Figs. 1-49, 82-148. A general term used to designate all kinds of cars, which carry goods, merchandise, produce, minerals, etc., to distinguish them from

those which carry passengers. English term, *wagon*. Figs. 116-19.

The cost of various styles of freight cars, as established by the rules for interchange of traffic, has varied in different years as follows :

	1894.	1893.	1892.	1891.	1890.	1879.
Eight-wheel box car, 32 to 35 ft.	\$500	\$520	\$575	\$575	\$450	\$425
“ “ box car, 32 ft. or under	480	500	350	550		
“ “ stock car, 32 ft. or over	500	530	....	....	....	....
“ “ stock car, 32 ft. or under	470	490	550	550	450	..
“ “ gondola car, 20-ton, drop-bottom	430	450	525	525	375	....
“ “ gondola coal-car, 20-ton, hopper-bottom	505	525				
“ “ gondola, 31 ft. or over	380	400	..	....	....	....
“ “ ordinary gondola, less than 31 ft.	355	375	475	450	....	....
“ “ ordinary flat car, 31 ft. or over	340	360	400	400	....	....
“ “ ordinary flat car, under 31 ft.	330	350	425	425	350	....
Four-wheel gondola car, with truck and drop-bottom	305	325	350	350	....	....
“ “ box car	230	250	300	300	250	....
“ “ ordinary coal car	205	225	250	250	235	....
One pair four-wheel trucks	222	230	275	275	225	210

For varieties of freight cars, see *Car*. For lettering (which see) of freight cars, see figs. 658-68.

Freight-car bell-cord guide. Fig. 716. Bell-cords are not, as a rule, used at all on freight cars.

Freight-car lock. Figs. 1011-18, 1108-9. A lock for fastening the doors of freight cars. The usual freight-car lock is a simple padlock with seals, but *stationary* or *fixed freight-car locks* are in increasing use.

Freight-car trucks (diamond type, which see). Figs. 1907-40. (Miscellaneous types.) Figs. 1941-53.

Freight-house truck. Figs. 1898-1906. A *freight truck*, which see. See also *Barrow-truck*. *Wagon-truck*.

Freight-train brake (compression). Figs. 368-9. See *Compression brake*. *Brake-gear*. (Westinghouse.) Figs. 386-357. See *Westinghouse brake*.

Freight-truck. Figs. 1903-6. A two-wheeled vehicle, universally used about stations for loading and unloading freight. A *baggage-barrow* is much the same. Baggage-barrows and freight-trucks are both sometimes designated as freight or baggage *barrow-trucks*. See *Freight barrow-truck*, figs. 1903-6. *Freight wagon-truck*, fig. 1899. *Push baggage-car*, fig. 1713.

Freight wagon-truck. Fig. 1899. A four-wheeled vehicle for moving freight by hand.

Fresnel lantern. Fig. 966. A lamp inclosed in a cylin-

e more used in

d of concentric
stances, one or
erical surfaces.

is to reduce its
the liability of
, and also to re-
the rays which
ade of a hollow,
ual lamps. The
ssive rings, the
by spherical sur-

phore lens is a
ave.

n-block.

bearings, which

See *Chafing-*

posed between a
h it slides to di-
er, figs. 791-801.

Front hot-air pipe (Gouge heater). 9, figs. 1405-7.

Front-lining (Gouge heater). 61, fig. 1410. A part used to make the double air-chamber that protects the front of case.

Front of case (Gouge heater). 87, fig. 1412. See above.

Front-offset (Gouge heater). 85, fig. 1409.

Friction-washer (lower and upper) (of swing link-hanger, which see). 3 and 7, figs. 2110-1.

Front-rest (for cross-bar of Gouge heater). 8, fig. 1444.

Front seat-bottom rail (street cars). 37, figs. 1843-6. See *Seat-bottom rail*.

Front seat-rail (street cars). 36, figs. 1843, 1844.

2. (English.) 104, figs. 204, 205, 206.

Fruit car. Figs. 121-5. A car of special design for the carrying of fruit and other perishable products requiring ventilation. The ventilators are so arranged that they can be opened and closed while the car is in motion, so that there may be a constant stream of fresh air passing through the car. Ice is not used. They are fitted with the Miller platform and Westinghouse air-brake, being run largely in passenger trains or at passenger speed.

Fulcrum. 1. "In mechanics, that by which a lever is sustained, or the point about which it moves."—*Webster*. See *Brake-lever fulcrum*.

lamps (centre lamps, side lamps), *lamp-burners*, *lamp chimneys* and *shades*, *lanterns*, *locks*, *miscellaneous*, *mouldings*, *postal-car*, *saloon*, *seals*, *seats* (parlor-car chairs, seat-arms, etc., seat-ends and mouldings, upholstery details), *sleeping-car stoves* and *heaters* (Baker, Bissell, Gouge, Johnson, miscellaneous, ranges and cook-stoves, Searle, Spear, suspended heater, Winslow), *table*, *ventilators*, *wash-room*, *water-coolers*, etc., *window* (deck sashes, lower windows).

Of the above list, it might be questioned whether mouldings and stoves or heaters would be ordinarily classed as furnishings, though so classified for convenience.

Furniture car. An extra-sized box car. Usual dimensions about 34 ft. over end-sills, 9 ft. 4 in. over side-sills, 7 ft. 6 in. from top of sills to under side of plate. More particularly designed for carrying furniture and made extra large.

Furring. 59, figs. 155-85; 12, fig. 186. Pieces of wood placed in a wall or other position to nail something to, as a panel or moulding. See *Panel-furring*.

Furring-blocks. 12, fig. 186. See above.

Fusee. The cone or conical part of a watch or clock, round which is wound the chain or cord. It is a very ancient mechanical contrivance, and is made of a cone form in order to equalize the power of the spring, the leverage of the cord increasing as the resistance of the spring increases, and *vice versa*. Fusees are shown in figs. 1249 (*berth-spring fusee*) and 1708.

G

Gagger. A *chaplet*, which see.

Gain. "In architecture, a beveling shoulder, a lapping of timbers, or the cut that is made for receiving a timber."—*Webster*. In car work the term generally means a notching of one piece of timber into another. *Boxing* is almost a synonymous term. The timbers are *boxed out* in order to *gain* them into each other. A *mortise*, which see, is usually deeper and does not extend clear across the stick.

Galvanized iron. Sheet iron coated with zinc by immersing it in a bath of the liquid metal covered with sal ammoniac, after first cleaning it in a bath of dilute acid. An amalgam of 11.5 zinc and 1 mercury is sometimes

used. It is usually made in sheets about 2 feet wide by 6 to 9 feet long, and its thickness measured by its number, wire-gauge (W. G.). See *Kalamined iron*.

Gardner's geared seat-arm. Figs. 1181-1142-3. A device for giving a backward slope to car-seats with reversible backs by a rack and pinion movement in the seat-arm and seat-arm pivot. Several other devices for the same purpose exist. See engravings.

Garnish rail (English). 111, figs. 204-6. A horizontal piece of ornamental wood curved on the upper surface and placed on the inner side of the mouth of the slot into which the movable window falls. It carries the *glass string roller*, which see.

Gas-burner. "The jet-piece of a gas-lighting apparatus at which the gas issues and combustion takes place."—*Knight*. A system of gas burning is in use on the Pennsylvania Railroad by compressing ordinary city gas. Another and more elaborate system is the *Pintsch*, which see, figs. 812-27.

Gas-pipe. See *Pipe*.

Gas-pipe fittings. Figs. 1837-49, etc. See *Pipe-fittings*.

Gas-tube (sun burner). Fig. 896. A safety device for conducting to the flame and utilizing for light the volatile products evaporated by the heat of the burner.

Gasket. "A strip of leather, tow, or textile fabric, to form a packing or calk a joint."—*Knight*. The term is also applied, probably with perfect correctness, to sheets of lead, copper, etc., used for the same purpose. The Westinghouse engine and air-pump gaskets, 38-41, figs. 293-9, etc., are copper. A peculiar gasket or packing-ring of rubber faced with lead to prevent the gas injuring the rubber is used in all joints of the Pintsch gas apparatus, figs. 824-5.

Gaskets take their name from the parts which they are used with.

Gasolier. A recent attempted addition to the English language signifying a chandelier burning gas. It is unauthorized by good usage.

Gate. 1. See *Platform-gate*.

2. (Of a casting-mould.) The opening through which the melted metal is poured. Also called *Ingate*.

Gauge. 1. (Of track.) The distance in the clear between the heads of the rails of a railroad; 4 ft. 8½ in. is the *standard gauge*; if greater than this, a *broad gauge*, which see; if smaller, a *narrow gauge*, which see.

irregular or ex-
ed gauge, in dis-
ing construction.
andard of measure-

itch-gauge.
read gauge.
nd axle gauges.
erth-gauge.

term is used to
es for effecting
gear. *Draw-gear.*

a they have cogs

Gardner's geared

724-6, etc. Any
erm is usually re-
heels in gear, the
gear-wheel is also

vulcanized fibre.

The principle of the coupler is the use of a rectangular beveled pin which is automatically driven upward by the action of an ordinary link in coupling and operates much the same as a common pin. It does not dispense with a loose link of common form.

Gimlet-pointed screw. The common *wood-screw*, which see, of carpentry and joiner work, having its screw cut to a point like a gimlet so that it can force its own way into wood.

Girder. "In architecture, the principal piece of timber in a floor. Its ends are usually framed into the summers, or breast-summers, and the joists are framed into it at one end. In buildings entirely of timber, the *girder* is fastened by tenons into the posts."—*Webster*.

"The term *girder* is restricted to beams subject to transverse strain, and exerting a vertical pressure merely on their points of support."—*Stoney*. The term is almost synonymous with *truss*. Thus, engineers speak of a "Howe *truss*," a "Pratt *truss*," a "Warren *girder*," and a "lattice *girder*." The distinction is that a *truss* consists of separate parts held together by pins, or even simply by pressure, which may be taken down and re-erected; whereas a *girder* is a single solid struc-

Glass-frame stile (English). See *Door-light stile* and *quarter-light moulding*.

Glass-plate guide (seal-lock). D, fig. 1011.

Glass seal (seal-lock). B, figs. 1011-18.

Glass-string, or glass-strap (English). 204, fig. 205. A leather strap by which the window in the door of a carriage is raised or lowered. The strap is pierced with a number of holes which fit a small brass or ivory knob placed on the door immediately under the *glass-string roller*, which see.

Glass-string roller (English). 195, fig. 205. In a carriage, an ornamental roller attached to the upper edge of the *garnish-rail* in a door. The leather strap (*glass-string*) by which the window is raised and lowered passes over this roller.

Glass water-gauge. A gauge consisting essentially of a vertical glass tube connected at top and bottom with a boiler so as to make the height of water therein visible. For *Johnson heater*, see fig. 1472.

Globe. See *Adjustable globe*. *Lamp-globe*.
Fast lamp-globe. *Loose-globe*.

2. (Of Pintsch gas-burner.) Fig. 816. A globe of hemispherical form, admitting air only from the top. It is an almost universal type of car lamp-globe in Europe.

Globe-chimney. Figs. 949-53. A *lamp-globe chimney*, which see.

Globe-holder. 7, figs. 828-68; for *lantern*, fig. 978. Any contrivance for holding a globe on a lamp. Usually it consists of a metal ring, at the base of the globe, on which the latter rests, and to which it is fastened with springs, screws, or by the pressure of the globe-chimney on top when the latter is adjustable. See *Adjustable* and *Detachable globe-holder*.

"**Globe**" lamp-shade or lamp-globe. Fig. 948. See *Lamp-shade*.

"**Globe**" ventilator. Figs. 1558-9. A ventilator of spherical form, with annular openings, which produces an induced exhaust current in whatever direction a current of air strikes against it.

Glue. A preparation from the hoofs, horns and hides of animals, washed in lime-water, boiled, skimmed, strained, evaporated, cooled in moulds, cut into slices and dried upon nets. If good, it is a hard cake, of a dark but almost transparent color, free from black or cloudy spots and with little or no smell. The more transparent and

amber colored the better. Inferior glue made from bones will almost entirely dissolve in cold water; other kinds are contaminated with lime. Glue is better for remelting. The strength of glue for common work is increased by adding a little common chalk.

Glue size. One pound of glue in a gallon of water. *Double size* has about twice this quantity of glue. *Patent size* is a kind of gelatine.

Gondola car. Figs. 15-36, 113-5. A flat car inclosed with low *side-plank*, usually fixed, but sometimes hinged so that they can be let down, and in some cases removable. Four-wheeled gondola-cars, fig. 19, are somewhat used. *Hopper-bottom* gondola cars, figs. 16-18, are largely used.

Gong. A *signal-bell*, which see.

Goods wagon (English). Figs. 116-119. American equivalent, *freight car*. See *Wagon*.

Goose-neck (Eames coupling). 16, figs. 280-1. A *brake-hose nipple* connecting the coupling-hose to the brake-pipe.

Gouge "ventilator" heater. Figs. 1405-71. One of the class of heaters relying on distribution of warm air, by pipes, through the car. It consists of a cast-iron base and a wrought-iron *fire-box*, fig. 1414, inside of which are two wrought-iron radiators. These parts, with the *injector-pipe* 56, the front and back *hot-air pipes* 54 and 55, the *deflector-pipe* 53, and the *smoke-pipes* 58 and 59, are inclosed in a galvanized-iron *case*, fig. 1412, through the top of which the *smoke-pipe* 58 is connected with the *smoke-head* 62 by the *connecting-joint* 78. The *injector* catches the fresh air that is forced down by the motion of the car through the *injector-pipe* 56, in which there is a valve 74-6, to the base of the heater, where it passes into the *case*, and into contact with the heating surfaces. The heated air is then forced into the front and back *hot-air pipes* 54 and 55, that supply the running-pipes, through the front and back offsets 85 and 86 (fig. 1409). The further course of the heated air can be traced in the engravings.

Governor (Westinghouse brake). 1, fig. 816. See *Pump-governor*.

Governor-block ("American" automatic compression-brake, which see). 2, figs. 368-9. A pair of cast-iron blocks pivoted at one end to the *axle-clamp* 1, surrounding the axle, by the *governor-block*, *pin* and *key* 31, and

nor-block spring
When centrifugal
of the axle, a pin
acts actuates the
gear.

("American")
figs. 368-9. See

figs. 656-7, etc.
handles and hand.
cars for the use
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rab-iron.

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tion, but no other

6-7 are in the po-

latter against the triple-valve piston when it is forced downward.

Graduating-stem (triple-valve of Westinghouse brake). 7, figs. 332-3; 10, fig. 353; 6, figs. 365-7. A slender rod or pin which works in a hole drilled in the centre of the triple-valve piston, and which, by the movement of the latter, opens and closes communication from the chambers above and below the piston.

Graduating-valve (of Westinghouse triple-valves). Figs. 332-3, 355-7. See above and *Triple-valve*.

Grain-car. A box car with tight inside *grain-doors*. Nearly all box cars are provided with them.

Grain-door. Fig. 3; 62, figs. 89, 93. A close-fitting movable door on the inside of a box car by which the lower part of the door-opening is closed, when the car is loaded with grain, to prevent the latter from leaking out. Such doors are usually made so that they can be thrown over on one side of the door-way, and thus be out of the way when they are not used. A great variety of mechanical devices are used for accomplishing this purpose, of which the *Susemihl & Miller grain-door*, figs. 373-6, and *Van Lieuw grain-door*, figs. 377-82, are shown with names of parts.

Grain-door lock (*Van Lieuw grain-door*). 6, fig. 380.

iron or wooden bars, used on cars for carrying live-stock. Grated-doors are also shown in figs. 5-9, 38-4.

Grate-follower (Johnson heater). Fig. 1472. A plate attached to the grate-shank designed to prevent the exit of dust into the open air when the grate is shaken laterally.

Grate-follower (Johnson heater). 17, fig. 1472. See *Follower*.

Grate-follower frame (Johnson heater). 18, fig. 1472.

Grate-frame (Gouge heater). Fig. 1459. The frame for the rectangular fixed-grate.

Grate-rest (Gouge heater). Fig. 1461.

Grate-ring (Spear heater). 19, fig. 1490; fig. 1528b. A cast-iron ring which surrounds the grate.

Grate-shaker (Baker heater). Fig. 1320. An iron bar which can be attached to a grate to move it in shaking the fire.

Grate-shank (Johnson heater). 15, fig. 1472. The spindle on which the grate revolves and is supported.

Grate-slide (Gouge heater). Fig. 1445. A movable piece on the back of the cast front, fig. 14084, in which the grate-shank works.

Grating.
 See *Clinker grating.* *Ventilator grating* (fruit
 Ice-box grating (refrigerator cars). car).
 Window grating.

Gravel car. A car for carrying gravel; usually either a *tip-car* or a *flat car*, the latter most used. They are often fitted with a central rail, over which a *ballast plow*, drawn by the locomotive after detaching it from the cars, works to unload the car.

Grease axle-box (English). 34, figs. 116-119 and 204-205. An axle box which is lubricated from above by a grease composed of tallow, soda and water, which is solid at ordinary temperatures and melts should the box get warm. This form is being superseded by the *oil axle-box*, which see.

Grease-box. A *journal-box*, which see.

Grease-chamber (English). 35, fig. 204 and fig. 219. A cavity above the journal-bearing which contains the lubricating material in a *grease axle-box*, which see.

Grommet. Figs. 802-804. "A ring formed with spliced rope (*Nautical*)." The separate parts of any metallic eyelet are known as *grommets*. The two grommets, when compressed together (with a *setting-die*), form the *eyelet*.

Ground glass. Glass whose surface has been roughened by mechanical or chemical process so as to break up the light passing through it and destroy its transparency. Several processes exist; by the wheel, sand blast, rotating with pebbles, or by fluoric acid. The sand-blast is at present most commonly used.

Group-spring. Figs. 2067-88. A spiral car-spring formed of a number of separate springs, single or nested, united together by a common pair of *spring-plates*. It is called a *double*, or *two-group*, a *three-group*, *four-group spring*, etc., according to the number of separate springs.

Guard. 1. See

<i>Dash-guard.</i>	<i>Fender-guard.</i>
<i>Door-guard.</i>	<i>Heat-guard.</i>
<i>Draw-timber guard.</i>	<i>Lining-guard.</i>
<i>Dust-guard.</i>	<i>Mirror-guard.</i>

Window-guard.

2. (English.) American equivalent, *conductor*. A railway official traveling with and having charge of a railway train. He unites the functions of the conductor, baggage-master, express agent and brakeman, but seldom collects or nips tickets, and never issues them, or receives fares. An *assistant guard* is sometimes but not always carried.

3. (For lanterns.) The exterior wire cover surrounding the *globe* and protecting it from accident. They are termed either *single*, *double* or *triple guard*, according to whether the number of horizontal wires. Figs. 974-5-8-9 have a single guard, and figs. 980-82 a double guard.

Guard-band (street cars). See *Door-guard band*.

Guard-pipe (Creamer brake, which see). 19, fig. 268.

Guard-posts (fruit car). Fig. 124. A row of posts standing inside of the ventilators and serving as a fender for the load packed within so as to prevent obstruction to the ventilators.

Guard-rail gauge. Fig. 2117. One of the M. C. B. standards. By resolution of the M. C. B. Association the standard distance between guard-rails to be assumed in fitting on wheels, was fixed at 4 ft. 5 in., out to out of head.

Guard's van (English). American equivalent, *cabooses* or *baggage-car*. See *Brake van*.

Gudgeon. The bearing portion of a shaft, especially an upright wooden shaft. A rude journal bearing for slow motion. See *Screw-coupling nut* and *gudgeon*.

Guide. "That which leads or conducts."—*Webster*.

See *Bell-cord guide*.

Drawbar guide.

guide.
guide.
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r guide.
or column, 37,

fig. 1190.
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2.

Hammered car-axle. An axle made by forging under a hammer. Sometimes called *faggoted-axle*. Hammered axles are made either of slabs or bars of iron, which are piled together and then heated, welded and forged into the form of the axle by hammering, usually under a steam hammer. The slabs are made by piling small pieces of scrap-iron, which are then heated and welded together by forging, forming a *scrap axle*, which is by far in most extensive use, but the bars used for making such axles are sometimes made of rolled iron *muck-bars*, which see, and hence called a *muck-bar axle*.

Hammer-eye, or clevis (of a pile-driver car). 2, figs. 1821-4. See *Hammer*.

Hammer-rope (for pile-driver car). 39, figs. 1821-4. See *Hammer*.

Hammer-rope pulley (for pile-driver car). 40, figs. 1821-4.

A pulley sometimes attached to the floor of the *swing-ing-platform* directly in front of the hoisting-gear.

Hamilton refrigerator car. An ice and salt car having six or more vertical tanks at each end of the car to obtain a large refrigerating surface. Each of the tanks is surrounded by a metallic shield on which moisture may condense, also serving as air-flues for promoting circulation. See *Refrigerator*.

those in fig. 1710, or from their lightness, as the *three-wheel hand car*, figs. 1712-4, which weighs only 100 lbs. Hand cars for regular section service weigh from 400 to 800 lbs., generally about 600 lbs. *Telegraph hand cars* are a lighter class for the use of telegraph line-men.

Hand-car lever, or propelling lever. 19, figs. 1720-22.

Hand-car truss-rod. 26, figs. 1720-3. A transverse or longitudinal rod by which the floor-frame of a hand car is trussed.

Hand-car wheel. Figs. 2141-3. A light wheel for hand cars, with cast-iron rim and hub and wrought-iron spokes, or sometimes with a wooden centre.

Hand-hold. Another term for *grab-iron*, which see, in common use on the Pennsylvania Railroad system and elsewhere.

Hand-hole. See *Dust hand-hole*. *Fare-wicket*.

Handle. "That part of anything by which it is held in the hand. A haft. As the handle of a knife or other instrument."—*Worcester*. They are designated by the name of the part or thing to which they are a handle, as *Ash-pit door handle*, etc.

A *grab-iron* is often called a handle, and was so named in the last edition of this dictionary, but *grab-iron* is more common, and the part is not properly a *handle*, which means in general that part by which an object is held and moved about or controlled.

Handle spring (Westinghouse engineer's brake-valve). 15, fig. 334. A spring carrying a dog to hold the handle in any desired position.

Hand-rail. A bar or rail to take hold of with the hand; as the *body hand-rail* of passenger-car platforms, *door hand-rail*, *inside hand-rail*, and *step hand-rail* of street cars, and *roof hand-rail* or *brake hand-rail* of box and stock cars, 3, figs. 252-4, all of which see.

2. (Tank cars.) 121, figs. 139-42. An iron pipe supported on *hand-rail posts* on the outside of the running board, for trainmen to hold on to in passing cars.

Hand-rail bracket (postal cars). Figs. 1080-5. See also *Inside hand-rail bracket* (street cars, etc.).

Hand-rail brace (freight-car roofs). 4, figs. 252-4. See *Roof hand-rail*.

Hand-rail post (tank car). 122, figs. 139-42.

Hand-wheel (for slewing gear of pile-driver car). 48, fig. 1821-4. See *Slewing-gear*.

Hand wrecking or derrick car. Figs. 80, etc. See *Wrecking car*.

Hand-straps (street and suburban cars). 98, figs. 1848-8. Straps attached to the inside hand-rail for passengers to hold on by. Generally made in the form of a double loop.

Hand-wheel. A *Brake-wheel*, which see.

Hanger. 1. "That by which a thing is suspended."—*Webster*.

2. "A means for supporting shafting of machinery."—*Knight*.

See *Bell-cord hanger*.
Berth curtain-rod hanger.
Brake-hanger.
Door-hanger.
Link-hanger.
Parallel brake-hanger.
Push-rod hanger.

Rocker-bearing-timber hanger.
Safety-hanger.
Spring-hanger.
Step-hanger.
Strap-hanger.
Swing-hanger.
Swing-link hanger.
T-hanger.

Hanger-link. A *Swing-hanger*, which see.

Hanger-pin (of "American" steam driver brake). 17, figs. 358-9, 368-5. The pin by which the *brake-shoe hanger*, or *forked hanger* is attached to the brake-shoe.

Hanger-stud (of "American" steam driver brake). 10, figs. 353-9; 16, figs. 368-5. The upper attachment of the *brake-shoe hanger* or *forked hanger*.

Hanging-boards, or meat-timbers (refrigerator car). Fig. 180a. Transverse bars resting usually on *bogus plates*, to which the load of meat is suspended.

Hanging-door sheave. Figs. 791, etc. See *Car-door hanger*.

Harrison postal-car chandelier. Figs. 840-2. See *Chandelier*. An elaborate form of postal-car chandelier with four lamps, having large reflectors all pivoted on a *revolving lamp-disk*, to throw a strong light on any point.

Hartshorn shade-roller. Fig. 1686. See *Shade-roller*. An ingenious device to hold window-shades at any desired point by means of *centrifugal pawls* which fly out and do not check the revolution of the roller while in rapid motion, but engage with and hold it at any point otherwise. The *McKay* shade-roller is somewhat similar, but uses a cam instead of a pawl.

Hasp (also sometimes termed *shackle*). I, fig. 1011; B, figs. 1108-9; 3, fig. 1109. The bar which fits over a *staple* and is fastened thereon by passing the *shackle* of a padlock through the staple or by a pin. The other end of the

in any one or several other-

Figs. 1154-8. One of the leading
irs for railroad use. In its com-
arate adjustments of the foot-
head-rest. A *rear foot-rest* is
or the benefit of the occupant
. The adjustments are con-
chair-back latch and *adjusting-*

re placed under the ceiling of a
h hats can be hung up by their
metal plate called the *hat-cord*
re hole and wedge bushings, is
car, and eyes called *hat-cord*
en. See *Hat-post*.

ave. Fig. 791. See *Car-door*

metal hook for hanging hats on.
2, figs. 1271-2, 1551-2. An up-
ping hats on. These are used
for cars.

1552.

which see.

carrying tailed bay; usually
and doors than ordinary box

upper end, which closes up, and the lower
in place at the back and front by *head-boa*
ing at the back into a *bushing*, fixed to
stationary seat-back, and along the upper
a *head-board coupling*, entering into a *hea*
ling keeper. The head-board bolt for the
the head-board is of peculiar constructio
avoid all interruption of a flush surface
still giving a secure attachment.

Head-board bolt. Figs. 1278-82; 17, figs.
above.

Head-board-bolt bushing. Figs. 1280-1.

Head-board coupling. Figs. 1275-6. A n
keeper by which a head-board is fastened
the car.

The titles to figs. 1275-6 are misplaced. F
read "Head-board-coupling keeper," and fig
board-coupling hasp."

Head-board-coupling hasp. Fig. 1276. Se

Head-board-coupling keeper. Fig. 1275.

Head-board lug. Fig. 1279 $\frac{1}{2}$. Serves sam
bushing, which see.

Head-board pocket. 32, figs. 676-81, 12

which closes up flush with the head-boar
opens at night, by releasing a *head-board* r
to afford a receptacle for clothing or parce

Head-casting (of a derrick or crane). 6, fig
casting placed at the upper end of the *bc*
forms of derricks. A similar one is shown

~~Head-casting (of a derrick or crane). 6, fig~~

Drawn head

head-linings is intended to be of an ornamental character. When of wood the head-lining is called *ceiling*. The duck for head-lining comes in any width up to 12 feet. Head-lining is sometimes cut up into panels, but a *paneled ceiling* is usually understood to be a wood ceiling, which is largely supplanting canvas head-linings.

Head-lining nail. Figs. 1045-54. A nail with a large button-shaped head especially made for fastening head-linings to the ceilings of cars.

Head-rest. 1. (Hartley chair.) See *Head-rest carrier*.

2. (English.) 199, figs. 204, 205, 206. In a first-class carriage, a fixed vertical wooden projection from the back of the seat, thickly padded with horse hair and covered with broadcloth or leather. It serves to support the side of the head of a passenger.

Head-rest carrier (Hartley chair). 10, figs. 1154-8. Arms pivoted to the upper portion of the back frame and carrying the *head-rest*. Their position is regulated by a *thumb-lever* at the side of the chair.

Headstock (English). 2, figs. 116, 117, 205 and 206. American equivalent, *end-sill*. The transverse end member of the *underframe*, which see. It is pierced transversely in the centre for the draw-gear, and the buffing gear is carried near the ends.

Headstock and diagonal-knee (English). 83, fig. 206. A wrought-iron knee connecting the *headstock* to the *diagonal* and the *sole-bar*, and thus binding three of the four main members of the *underframe* together.

Spring-link, or spring-shackle (English). 84, fig. 205. American equivalent, *spring-hanger*, a term also used in England. A link attached to the end of a laminated spring by which the weight is placed upon it.

Headstock cap (English). 13, figs. 205 and 207. A cast-iron cap fitting the end of the headstock in order to prevent its splitting, and to prevent any access of water to the end grain of the wood. A wrought-iron strap is sometimes used.

Heat-conductor (Bissell heater). Figs. 1363-4, 1362-7. Cast-iron hot-air flues near the stove connecting with the *running-pipes* along the corner of the car.

Heat-regulator. Figs. 1491-2. See *Spear's draft-regulator*.

Heater. Figs. 1800-1587. Any apparatus for warming a car, room or building by convection; that is, by conveying hot water, steam or warmed air into or through

the apartments. The term generally refers to any arrangement for warming apartments other than stoves, which heat by direct radiation. The varieties shown are the *Baker*, *Johnson* and *Searle* heaters, which circulate a hot fluid through radiators under the seats, the *Bissell*, *Gouge*, *Spear*, *suspension*, and *Winslow* heaters, which circulate hot air through *running-pipes* (*hot-air pipes*, or *delivery-pipes*) under the seats, and sundry forms of plain stoves heating by direct radiation. The latter are rapidly passing out of use, although still largely used. The *Gouge* has a particularly elaborate system of ventilation connected with it. The heaters which circulate hot water are usually placed in a small closet called the *heater-room*, which see. In emigrant cars *cook-stoves* are used as heaters. The *ranges* of dining-cars, although used for cooking purposes only, are shown in connection with the heaters.

2. (For Johnson heater.) Fig. 1472. A series of vertical pipes connected at each end to a hollow annular casting. The heater-pipes form the outside of the fire-pot.

3. (For lamp or lanterns.) A metallic attachment passing around and above the flame (figs. 933) or otherwise immediately adjacent to it, as in fig. 912, by which heat is conveyed to the oil in the reservoir below, to prevent freezing, or, in some cases, to assist combustion by heating or volatilizing the oil.

Heater-car. One constructed for the carrying of fruits, vegetables and other perishable products in winter. They are heated by special forms of mineral oil lamps, the supply to which is automatically controlled by the expansion and contraction of metallic rods. They are principally in use in the New England states for the transportation of potatoes and other vegetables.

Heater-room. Figs. 193, 214, etc. A small closet, cased with sheet metal interior *heat-guards*, to contain the heater and prevent all direct radiation. All heaters proper are placed in some equivalent for such rooms. The doors are usually closed with an open screen like fig. 1046.

Heater-pipe casing. 10, fig. 1122. A wooden or iron shelf over a heater-pipe in a passenger car to prevent the feet of passengers from coming in contact with the hot pipes. The casing also forms a foot-rest.

Heater-plate (of oil lamp). Fig. 912. A device to con-

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heater-plate.

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especially careful and elaborate system of insulation by air-spaces.

High-sided wagon (English). A four-wheeled gondola car, with sides about 4 feet high. Resembles wagon shown in figs. 116-119, except that the sides are higher. Used chiefly for bulky freight, wheat, potatoes, sacks and bales. See *Wagon*.

Hinge. Figs. 779-90, etc. "A hook or joint on which a door, gate, etc., turns."—*Webster*. They are provided with a tube-like *knuckle* through which the *hinge-pin*, which see, passes.

See *Door-hinge*.

Double-acting hinge.

Drop-door hinge.

Man-hole hinge.

Seat-hinge.

Sofa-hinge.

Stop-bar hinge.

The common door-hinge is usually a *butt* or *butt-hinge*, the varieties of which are the *acorn-butt*, a large ornamental hinge, *Blake-butt*, which see, and the *hopper-butt*, so called from its pointed form. The *parliament hinge* is a sort of T-shaped butt-hinge to afford more room for screws. It is little used except for ornamental purposes. The *strap-hinge* is a common form of rough hinge for heavy doors, but it is sometimes made very elaborate and ornamental. A *T-hinge* is a combination

brakes on each truck of a car simultaneously, and equalizing the pressure on all the wheels. The brake may have either one or two levers on each truck. Underneath the car-body are two levers called *floating-levers*, with movable fulcrums in their centres, which are connected together by a rod. One end of each of these levers is connected by a rod and chain to the brake-shaft, and the other end of the floating-lever is connected by a rod with the long arm of a brake-lever on a truck.

Hog-chain. "(Shipbuilding.) A chain in the nature of a tension-rod passing from stem to stern of a vessel, and over posts nearer amidships; designed to prevent the vessel from drooping at the ends."—*Knight*.

Hence applied to certain forms of trusses in car construction, as in the pile-driver car, 36, figs. 1281-8, or wrecking car, B², figs. 146-50. A hog-chain is an *inverted* truss-rod, and usually so called when applied in connection with and in similar form to a body truss-rod, as in figs. 146-50, the object of a truss-rod being to prevent a beam from sinking in the middle, and of a hog-chain to prevent sinking at the ends when supported at the middle.

Hog-chain queen-post (iron-frame wrecking car.) B⁴, figs. 144-9. See above.

Hog-chain rod (of a passenger car). 167, fig. 159. See above. More properly a *continuous counterbrace rod*.

Hoisting-block (of a derrick or crane). 3, figs. 77-8. The main block at the lower end of the *hoisting-chains* carrying the *sheave-hook*, or hoisting-hook, to which the load is attached.

Hoisting-block clevis. 4, figs. 77-78. A clevis carried at the top of a hoisting-block to which the fixed end of the hoisting-chain is attached. In some cases, as in L, figs. 151-3, it is attached to a clevis at the upper end of the boom.

Hoisting-chain (of a derrick or crane). 21, figs. 77-8. The chain attached to the hoisting-drum at one end and to the hoisting-block or boom-clevis at the other, by which the loads are raised.

Hoisting-chain sheave. E², figs. 144-7. A pulley placed in some wrecking cars at the foot of the mast, when the hoisting-gear is at some distance from it. The term is equally applicable to the *mast-sheave* and *boom-*

sheave at the top of those parts of a derrick, but the latter are generally otherwise distinguished.

Hoisting-hook. 2, figs. 77-78. See *Sheave-hook*. See also *Hoisting-block*.

Hoist double-spring drawbar. Figs. 426-7, 98-6, and in use attached to a car in figs. 98-96 and 113-15. A method of placing auxiliary draw-springs in a car so as to give a separate spring for buffing and for tensile strains, and also to obtain in effect a continuous drawbar.

Holder. "Something by which a thing is held."—*Webster*. A great variety of parts which serve this purpose are so called, as *door-holder*, *lamp-holder*, etc., which take their names from the thing which they hold.

Hollow-spoke wheel. Figs. 2127-8. See *Car-wheel* and *wheel*.

Hood. 1. See *Platform-hood*. *Ventilator-hood*. A roof-apron which is attached to both *platform-roofs* and *platform-hoods* is sometimes called a hood.

2. (Spear heater.) Figs. 1486-8. More properly a *ventilator* or *wind-scoop*. A horizontal tube or covering on the outside of a car, and on top of the cold-air pipe, so as to give the latter a T shape. The air is admitted to the pipe through the ends of the hood, which are covered with wire netting to exclude cinders. It has a valve which is moved by the current of air so as to admit it whichever way the car runs.

3. (For urinal.) Figs. 1092-3. More properly *ventilator cap*. A similar but less elaborate part to that defined apart.

Hook. See

<i>Bell-cord end-hook.</i>	<i>Hat-hook.</i>
<i>Berth-catch hook.</i>	<i>Hat-post and hook.</i>
<i>Berth-curtain hook.</i>	<i>Pouch-hook.</i>
<i>Body check-chain hook.</i>	<i>Lamp-case hook.</i>
<i>Check-chain hook.</i>	<i>Sail-hook.</i>
<i>Coat-and-hat hook.</i>	<i>Slanting table-leg hook.</i>
<i>Coat-hook.</i>	<i>Stake-hook.</i>
<i>Coupling-hook.</i>	<i>Table-hook.</i>
<i>Door-hook.</i>	<i>Table-leg hook.</i>
<i>Door-latch hook.</i>	<i>Tank-band hook.</i>
<i>Drawbar coupling-hook.</i>	<i>Tassel-hook.</i>
<i>Draw-hook.</i>	<i>Truck check-chain hook.</i>
	<i>Window-curtain hook.</i>

Hoop (for oil lamps). Figs. 918-23. A ferrule with an interior thread into which the burner screws.

Hoopstick (English). See *Hoofstick*.

Hopkins' journal-bearing. Figs. 1993-4. One of the principal if not the only form of *lead-lined journal-*

f class of *four-wheeled* cars, but bottom cars are also largely used. *cars*, figs. 16-18, etc., have a centre, but not so formed as to ir contents without assistance. *ump-cars*, as are also *tip-cars*, n appearance between the two. *Iron-hopper* coal cars, resem-, which is a type largely used Railroad, are also used, and the often made of iron *hopper-plates*

between the terms *hopper-bottom* the hopper-bottom discharges its the doors, while a drop-bottom car, ar with a trap in the centre, does well observed.

109-12. See *Drop-door chain*.

86, figs. 109-12. The sheets bottom of a hopper-bottom coal of wood it is termed the *inclined*

109-12. This reference is er- l *inclined-floor cross-bar*, which

1097-9. See *Bell's exhaust*

95, figs. 82-84, 182-186. A ie end of a car-body, whose posi- i of vertical so that it can be

which the coupler and buffer springs s 8. (Janney-Miller coupler.) 49, fig: *Horn-bolt* (Janney coupler). 19, fig: bolt securing the horn in place.

Hornplate (English). The name give locomotive or tender which on other r termed *axle-guard* (American, *pedesta* *Horse box* (English). A four-wheele adapted to run on passenger trains. large side doors and manglers, and is stalls by movable padded partitions. *box*.

Horse-car. 1. Fig. 8. A box-car fitted carrying horses, by leaving certain etc. They are then classed under th *box-stock* car. Some horse-cars are v.

2. Figs. 1835-64. *Street cars*, whic horses, are very frequently called hon *Horse-hook*, or towing-hook (English Nearest American equivalent, *pull-in* attached to the sole-bar and forming a rope by which the vehicle can be d largely used for switching in England *Horton chair*. Figs. 1162-3. A fo parlor-car chair. The adjustments o is capable and the names of the sepa similar to those of the Hartley chai the details of construction are differ *Horton chair-car*, or simply *chair-car*.

sometimes *armored*, which see. See also *Brake-hose*.
Coupling-hose. *Tender-hose*.

Hose-couplings. See *Brake-hose couplings*.

Hot-air box (Winslow heater). Fig. 1533. A box, in other heaters called the *running-pipe* or *hot-air pipe*, passing along the sides of the car under the seats with a register adjacent to each seat and connecting with the air space around the stove, so as to deliver hot air through the car.

Hot-air conductor (Bissell heater). Figs. 1363-4. See *Heat-conductor*.

Hot-air delivery-pipe (suspended heater). G, figs. 1529-32.

Hot-air elbow end box (Spear heater). Fig. 1523.

Hot-air flue (suspended heater). E, figs. 1529-32.

Hot-air pipe. 1. (Gouge heater.) 54 and 55, figs. 1418-4 (*back* and *front*). The vertical pipes within the case connected with the delivering *running-pipes* by the front and back *offsets*.

2. (Bissell heater.) Fig. 1350.

3. (Spear heater.) 3, figs. 1486, 1490.

Hotel-car. Fig. 54. A sleeping car with a kitchen for cooking and arrangements for serving meals. *Dining cars* have kitchens, etc., but no sleeping-berths. Hotel-cars seem to be passing out of use in favor of dining cars.

Hotel-car range. Fig. 1490. See *Range*.

Hot-water heater. Figs. 1484-5. See *Searle hot-water heater*. The Baker, Johnson, etc., heaters are also hot-water heaters, although not so styled.

House-car. An occasional term for a *box car*, which see.

House of the drawbar. Figs. 403-4. See *Drawbar*.

Housing-box. A *journal-box*, which see.

Howard's parlor-car water-closet. Figs. 1067-89. A device, the essential feature of which is the connection between the seat-lid and the pan and service measure, by which no water is carried to the pan except on opening the lid. See *Parlor-car water-closet*.

Howard safety berth-latch. Figs. 1361-2. See *Safety berth-latch*. The *Dayton* is another kind. The two differ very slightly.

Howard stove. Fig. 1475. An old-fashioned wood-burning stove. Wood is now little used as fuel on cars.

Hub (of a car-wheel). 21, fig. 3003; figs. 3124-30. The central portion into which the axle is fitted. It is usually

cylindrical in form, and projects beyond the disks or spokes of the wheel on each side. In England termed the *boss*. See *Interchangeable hub*.

Hub-bolts (steel-tired wheels, which see). Figs. 3159-71.

Bolts fastening the *face-plates* to the *hub*.

Hurricane-lamp (another name for *tornado-lamps*, which see). Figs. 835, 838, 845, 860, 867, are hurricane, or tornado-lamps.

Hutchin's car-roof. A form of roof consisting of two layers of boards with a species of dovetail joint to connect them, and separated by a continuous sheet of thin painted canvass. See *Car-roof*.

Hydraulic jack. Figs. 1884-97. A tool or machine in which the power is exerted by means of the pressure of some liquid acting against a piston or plunger, for raising heavy weights, like a car. The pressure on the liquid is produced by a small pump worked by hand.

Hydraulic-pressed car-candles. Candles made of paraffine by hydraulic pressure. See *Candles*.

I

I-beam. A general term applied by makers to any form of rolled iron having an I cross-section. The top and bottom parts are termed the *flanges* and the middle the *web*. The usual dimensions are given by the total height from out to out, and vary from three to fifteen inches. When one of the flanges is simply a round bar it is termed a *deck-beam*. I-beams are but little used in car construction, channel-bars being used instead for trucks; but they are sometimes used for iron centre and intermediate sills, as in figs. 148, etc., channel-bars being used for the side-sills.

Ice-car. A car for transporting ice, usually constructed with double roofs, floors and sides, filled in with sawdust or other non-conducting substance.

Ice-pan (refrigerator cars). 4, figs. 180, etc. The receptacle for carrying ice, especially roof ice-pans, in distinction from *ice-racks* at the ends of the car.

Igniter, or signal-holder (for blue-light signals). Fig. 1043. A wooden handle having a piston in the end for igniting the blue-light by compression.

Inclined floor (coal cars). 134, figs. 105-7. Subdivided into *inclined end-floor* and *inclined side-floor*, the latter not always used. When of iron, as 20 and 36, figs. 109-

den sills to which the inclined ed.

g. 1825. A passenger street car re rope on a steep inclined plane. hat the floor will be level when incline, by making the wheels at the other, or by raising up one

l car). 185, figs. 106-7. See In-

w's steel-tired car-wheel). Figs. structured that the outer portion of off from it without removing the

hich, or Attock's body-block 04-5. A piece of rubber atcut ick, interposed between the body rving to deaden noise and vibra- e circulation of air to the floor

which exudes from a tropical tree and West Indies, Mexico, South pared for use by *vulcanizing* with rtion of sulphur, according to the its pure state it is used for little cil marks."

g. Fig. 2042, 2043-8. A spring ical block of india-rubber. Such l both for carrying the weight of d draw-springs. Now rarely used

1413-4.

Injector-valve (Gouge heater). 75, fig jector.

Injector-pipe valve-chain (Gouge 1 1413-4.

Inlet elbow (Gouge heater, which see).

Inlet-strainer (inner and outer), (Loren V and W, figs. 180-180). A wire gr

dirt and insects from the air-passages

Inner-coil (graduated bolster-spring). : *Spiral spring*.

Inner draw-bar carry-iron (Miller cou 638. A U-shaped strap of wrought

suspender-beam to support the drawl

Inner-hung brake. Figs. 227, 234, 1

brake-shoes and beams are *between* tl attached on the outside, it is an *outer*

Inner lamp-ring (English). 168, fig. :

tal metal or wooden ring in the inner surrounding the aperture for the roo

Inscription-plate (Miller platform). 4

Inside ash-pit door (*right and left*) (J and 5, fig. 1472.

Inside body-corner knee (English)

American equivalent, *sill knee-iron*, o

latter is used outside instead of insid

knee placed in a horizontal plane se

side of the body together.

Inside-casing (Baker heater). 5, fi

Sheet-iron bent and riveted into the

of the body attached to the framing of the sides and ends. Also called *inside lining*.

Inside-cornice (passenger car interiors). 24, figs. 152-76; 26, figs. 672-81, 692-3. A moulding which fills the angle where the roof joins the side of the car.

Inside-cornice fascia-board. 25, figs. 175-6; 37, figs. 692-3, 672-81. A projecting board which forms a moulding or ornament under the *inside cornice*. The *sub-fascia board* lies under it. The arrangement of these details, however, is frequently varied.

Inside-cornice sub-fascia board. 26, figs. 175-6; 38, figs. 692-3, 672-81. See above.

Inside door-knob (Kirby's car-door lock). A, figs. 1002-4.

Inside end-piece (of truck-frame). Figs. 1942-70. The end-piece which is nearest to the centre of the car.

Inside fire-door (Johnson heater). 13, fig. 1472.

Inside frieze-panel (street cars). 31, fig. 1848. A panel on the inside over a window.

Inside hand-rail (street cars). 24, figs. 1242-4. A rail, usually made of wood, attached to the rafters by metal *brackets*, and carrying leather straps in the form of loops for passengers to hold fast to.

Inside hand-rail bracket. 25, figs. 1242-4, 1256. See above.

Inside-lining. 1. 53, figs. 18-104; 57, figs. 175-6. The boarding which is nailed to the insides of the posts of freight, baggage and other cars. In box-cars it extends half way up only, to the *girth*. *Inside-lining* becomes sometimes *inside sheathing* when it is carried up to the roof, and is the only sheathing for the car, the frame being left exposed.

2. (English.) See *Inside casing*.

Inside-lining cap. A *girth*, which see. See also above.

Inside-lining stud. 176, fig. 98. A stud extending from the side-sill to the girth to serve as a "nailer" for the inside-lining.

Inside magazine-door (Johnson heater). 11, fig. 1472.

Inside mouth-piece (Gouge heater). 29, fig. 1448. A part extending from the inside of the fire-box into the *mouth-piece*, 27. It is bolted to the latter through the flanges. See *Mouth-piece*.

Inside perforated-top (Bissell heater). Figs. 1288, 1275. See *Perforated-top*. (Johnson heater.) 24, fig. 1472.

Inside-ring (Spear heater). 15, fig. 1490; fig. 1508. A

perforated circular casting placed between the fire-pot and the casing.

Inside-shell (Kirby's car-door lock). H, figs. 1003-4. A kind of escutcheon on the inside face of the door inclosing the *latch-pull* within it.

Inside spring-case. Fig. 2106. A shell cast on the spring-plates to keep the coils in place.

Inside top-plate (Spear heater). 11, figs. 1490, 1494-7, 1517-18. A cast-iron plate with a hole, in the centre or "set-back", to which the smoke-pipe is attached. It forms a cover for the fire-pot.

Inside wheel-piece plate. 12, figs. 1968-9. See *Wheel-piece*.

Inside window-panel. 29, figs. 155-81; 24, figs. 678-81; 35, figs. 692-5, 679-81. A panel inside of a passenger car between the windows.

Inside window-sill. 78, figs. 175-6; 5, figs. 692-4, 679-81. A horizontal piece of wood under the window on the inside.

Inside window-stop. 26, fig. 175; 7, figs. 692-5. A wooden strip attached to a window-post on the inside of a window-blind or an inner sash of a double window. It forms a groove in which the blind or window-sash slides. Also called *window casing*. Sometimes the *window-moulding* forms a stop on the inside.

Inspection car. 1. A car used for inspecting track of a railroad. One form is that of a gondola car, inclosed and roofed over, but left open in front and furnished with seats. In inspecting the track it is pushed in front of a locomotive with the open end forward.

2. Fig. 1710. A hand-car used for very much the same purpose. *Three-wheeled* hand-cars are used by roadmasters for inspection. See *Hand-car*.

Inspector's lantern. Figs. 960, 972-3. A general term, commonly meaning some form of bi-colored or tri-colored lantern, with colors changeable at will, usually by means of slides, but sometimes, as in figs. 972-3, by other devices. See *Burrell signal lantern*.

Interchangeable-hub wheel (Snow's). Figs. 2163-4. A wheel so designed as to have the tire and skeleton removable, leaving the hub upon the axle. See *Snow's interchangeable-hub wheel*.

Interchange of traffic (rules for). A code of rules adopted and amended from year to year, by an organization composed of master car-builders and others, who have held

Convention of
the rules are to
be used to connect-
specify (1884)
the following
(b.) Flat spots
(c.) Flanges
or $\frac{1}{2}$ inch from
1 inch thick.
of more than
ches. (f.) Axle
dimensions for

6 axles. $3\frac{1}{2}$ in.
" 8 "
" $2\frac{1}{2}$ "

Brake wheels,
purely fastened
in bad
or grain cars.
(L.) Intermedi-
provided for in
cars considered

sills and the centre-sills. When of iron, as **A₃**, figs. 144-9. They are usually 8-inch *I-beams*, which see.

Internal cylindrical gauge. A very accurately-made solid steel cylinder used as a standard of measurement of cylindrical holes.

Internal screw-gauge. Fig. 1833. A solid steel cylinder with a screw-thread on it, for testing the diameter of female screws.

Internal tire-flange (steel-tired wheels). Figs. 2163-76. A flange by which the tire is bolted to the wheel-centre.

Inverted arch-bar (diamond-truck side frames). 15, figs. 1907-33. A wrought-iron bar which rests on top of the journal-boxes with the *arch-bar*, which see, on top of it. Also sometimes called the *middle* or *lower arch-bar*, as in logging cars, fig. 1783. See *Centre-bearing inverted arch-bar* (for six-wheel trucks), figs. 1969-70.

Inverted body-queen-post (street cars and wrecking cars).

B₄, figs. 144-9; 24, figs. 1843-4. A post in the side of a car-body which supports the *inverted body-truss-rod*.

Inverted body-truss-rod (street cars and wrecking cars).

B₃, figs. 144-9; 23, figs. 1843-4. A truss-rod used as a *hog-chain*, which see, to prevent the ends of a car-body from sagging. It rests on two queen-posts on top

made wholly of iron. See *diamond truck*, which is the principal type. These are often made of iron with wooden transoms and spring-planks, although iron transoms are now used in many cases. Figs. 1907-40 are illustrations of different kinds of iron freight-car trucks, and figs. 1971-3, 1959, of passenger-car trucks, the latter being rarely of iron.

Italian-hemp bell-cord. See *Bell-cord*.

J

Jack. See *Jack-screw*, also *hydraulic-jack*, figs. 1884-7; *lamp-jack*, 136, fig. 158; *screw-jack*, fig. 1886; *smoke-jack*, or *stove-pipe jack*, figs. 1486-9; *ventilator-jack*, figs. 1092-4, etc.

Jacket (Winalow heater). Figs. 1583 and 1585-7. The outside covering surrounding the stove and affording space between the jacket and stove for the passage of cold air. This part is usually called the *case* or *casing*, which see.

Jack-screw (for pile-driver car). 21, figs. 1821-4. A jack-screw working on a *jack-screw pin* attached to the body, for relieving the springs of the cars from action and making the platform a rigid body. Tongs or crabs attached to the track are used to prevent the car body from rising upward when on the jack-screws. Another device for this same purpose is a *bolster jack-screw*, 8, fig. 148.

Jamb (of a door). 1, fig. 870. The *door-post* on each side of the door proper. *Ash-pit jamb*, which see, is a similar use of the term.

Janney car-coupler. Figs. 537-635. A drawbar arranged to couple cars automatically, invented and patented by E. H. Janney in 1870. The outer end of the drawbar is made of a forked or U-shape, and to one arm an L-shaped *knuckle* is pivoted. When the two drawbars come together, the two knuckles engage into each other with a rack and pinion movement, like a pair of teeth in spur wheels. The axis of the drawbar therefore remains always fixed, and does not move sidewise to couple as in the Miller coupler.

When the knuckles engage, the rear point of one or both of them is thrown back, and in its rearward motion it displaces the *catch* 3, fig. 544, which snaps back over the point of hook and secures it in place. The motion

of the catch is controlled by the *catch-spring* 25, which slides on the *catch-spring bolt* 15. The drawbar is cast hollow to contain the knuckle, catch and attached parts.

The buffers are caused to act simultaneously with the coupling-gear, so that the stronger the tension on the latter the stronger the compression on the buffers, by means of the *horn* and *yoke-lever*. The manner in which this is effected is highly ingenious but too complicated for description. The *main draft-spring* 26 acts as a buffer-spring in compression. The *centre buffer-spring* 26 acts as a buffer-spring in either compression or draft. Whether in buffing or in draught the faces of the buffers are always kept in contact; the buffers follow the movement of the coupler forward.

To uncouple, the upper end or handle of the *platform-lever* 24 is thrown toward the centre, and by means of the *pull-rod* 10 operates the *catch-lever* 22, and unlocks the knuckle 2, permitting the same to swing upon the knuckle-pin 16. A recent improvement is the *Janney-Miller coupler*, which see.

A long list of parts, as follows, are sometimes named with and sometimes without the prefix *Janney*. The following is a substantially complete list of all parts of the Janney and Janney-Miller coupler, except those entitled *combination*, etc., which see:

- Janney Auxiliary draft-spring*. 27, figs. 542-554, 555-601.
- " *Barrel of Janney-Miller coupler*. 40, figs. 542-554, 555-601.
- " *Brake-shaft stand*. 114, figs. 542-54.
- " *Buffer* (flat face). 4, figs. 542-554.
- " " (round face). 5, figs. 542-554.
- " *Buffer-guide*. 30, figs. 542-554, 555-601.
- " *Buffer-washer*. 34, figs. 542-554, 555-601.
- " *Catch*. 3, figs. 542-554, 555-601.
- " *Catch-lever*. 22, figs. 542-554, 555-601.
- " *Catch-spring*. 25, figs. 542-554, 555-601.
- " *Catch-spring bolt*. 15, figs. 542-554, 555-601.
- " *Centre buffer-spring*. 26, figs. 542-554, 555-601.
- " *Centre-spring washer*. 32, figs. 542-554, 555-601.
- " *Chafing-plate*. 109, figs. 542-54.
- " *Combination stop-brace*. 115, figs. 542-54.
- " " *Yoke*. 9, figs. 542-554.
- " *Coupling-pin*. 17, figs. 542-554, 555-601.
- " *Coupler-pin spring*. 94, figs. 555-635.
- " *Coupler-pin washer*. 93, figs. 555-635.
- " *Draft-bolt*. 11, figs. 542-554, 555-601.
- " *Draft-iron*. 112, figs. 542-54.
- " *Draft-washer*. 31, figs. 542-554, 555-601.
- " *End-face plate*. 8, figs. 542-554.
- " *Equalizer*. 6, figs. 542-554.
- " *Follower*. 113, figs. 542-554.
- " *Foot-plate*. 7, figs. 542-554.
- " *Fulcrum-bolt*. 12, figs. 542-554, 555-601.
- " *Fulcrum-ferrule*. 25, figs. 542-554, 555-601.
- " *Half-oval washer*. 23, figs. 542-554, 555-601.

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usually some kind of brass or bronze, which see, in contact with a journal, on which the load rests. In car construction the term when unqualified means a car-axle journal-bearing. A standard form has been adopted by the Master Car-Builders' Association, and is shown in the engravings, but its composition is not specified. The *Hopkins* or *lead-lined* journal-bearing is one coated on the inside with a thin sheet of lead to take up minor inequalities. *Babbitt-metal* in some of its many forms is used for car-journal bearings occasionally, and almost universally for the bearings of machinery. In order that the journal-bearing may be more easily removable, and to distribute the load more equally, a *journal-bearing key*, also called a *wedge*, *liner*, *slide*, *saddle*, *keeper*, etc., is used to hold the journal-bearing in place. The term "wedge" is in very common use, perhaps more common than the name here given. To remove the brass a *car-box jack*, fig. 1836, is used to take the load off the bearing by inserting it under the journal-box, when the wedge or key can be readily removed, and afterwards the bearing itself. See *Stop journal-bearing* and *stop-key journal-bearing*.

Journal-bearing key or wedge. 8, figs. 2002-3. M. C. B. standard, figs. 1927-2001. See above.

journal-box, by means of which oil and packing are supplied and journal-bearings are inserted or removed. Such covers are usually made of cast-iron, sometimes of wood. They are sometimes closed by a spring, as in fig. 2018, or the *Fletcher* lid, which see, and sometimes not, as in the *Hewitt* lid, figs. 2115-7.

Journal-box cover bolt. A bolt used to fasten covers which have no hinge to the box. Two of these are usually employed to each cover. A *gasket* of canvas, rubber or leather is used to make a tight joint. Journal-box covers are, however, now almost invariably held on by hinges and springs or some arrangement of lugs or grooved joints.

Journal-box cover gasket. Nearly obsolete. See above.

Journal-box-cover hinge-pin. 12, figs. 2002-3.

Janney-Miller coupler. Figs. 554-585. A modification of the Janney coupler so as to enable it to be rapidly changed into an equivalent to the Miller coupler, thus enabling cars provided with it to be run in connection with either Janney or Miller draw-gear. The principal changes to effect this end were as follows:

A joint was made in the barrel of the ordinary Janney coupler to provide for the removal of the head when it was desired to change to the Miller. There was added the part called the *centre buffer-yoke* in order to provide a connection between the centre buffer spring and centre buffer when used as a Miller coupling, the same springs being used, whether in use as a Janney or as a Miller coupler.

A spiral spring called the *side-spring*, with its bracket and clevis, was added to give the necessary side resistance to the Miller hook. The platform-lever was lengthened for the purpose of conforming to the difference in heights between the Janney catch-lever and the chain by means of which the Miller hook is moved in uncoupling, the same lever serving for either draw-gear. Followers and guides were provided and placed back of the centre buffer-spring to form a better base for that spring when used in connection with the Miller buffer.

The Miller stop 43 was added to the Janney platform.

After a little practice the change from the Miller to the Janney gear is made in from two to five minutes.

Jaw. See *Drawbar jaw*, 16, figs. 895-7, *Pedestal-jaw*, figs. 2081-5.

Jaw-bit. 77, fig. 2025; 5, fig. 1848. A bar extending across the mouth of a pedestal jaw underneath a journal-box and bolted to the horns of the pedestal.

Jaw-bolt. Fig. 1791. A bolt with a U-shaped split head, perforated to carry a pin. Used largely as a *brake-lever fulcrum* on brake-beams.

Jaw-spring. A *journal spring*, which see. Figs. 2026, 2091.

Jeffrey "Railroad Speeder." Fig. 1717. A hand-car of quite new design which uses the power of the legs, by means of a treadle movement, instead of the arms, as a motive power. It has as yet only been applied to light inspection uses, but is claimed to be very light running and with apparent justice, as the motion is beyond doubt that by which man can exert the greatest amount of power with the least fatigue.

Jib (of a derrick or crane). Figs. 144-5, etc. More properly *boom*, which see.

Johnson heater. Fig. 1472. One of the class of heaters which rely upon circulating a hot fluid through radiating pipes passing under the seats and side of the car. The fluid used is a solution of *glycerole of calcium* which boils at 236° Fahr., and which is said not to congeal at a temperature of 45° below zero, but water is also used. It is a *base-burning* heater, which see.

Journal-box-cover spring. 1, 13, figs. 2002-3. A flat spring to hold the lid in place. Various journal-box lids are in use, as the *Hewitt*, which see, which dispense with a spring.

2. (For *Fletcher* journal-box lid, which see.) Figs. 2019-20. A spiral spring slipping over a sleeve which slips over the bolts. The drawing is not quite correct, as it does not show this sleeve and does show a pin not used.

Journal-box guides. 99, fig. 1959. Iron bars or blocks placed one on each side of the journal-boxes of some iron frame trucks in which *journal-springs* are used. These irons, while holding the box in place longitudinally and transversely, allow it to have a vertical motion between them. When a pair of these guides is cast in one piece it is called a *pedestal*, which see.

Journal-box lid (*Hewitt's*, which see). Figs. 2015-17. See also *Journal-box cover*.

Journal-brass. A *journal-bearing*, which see.

Journal distance-gauge. Fig. 2118. One of the M. C. B.

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Keeper. "A ring, strap, pocket, or the like device for detaining an object; as

1. "A jamb nut.

2. "The box on a door-jamb into which the bolt of a lock protrudes when shot, as figs. 1020-4, etc. When the keeper is for a beveled *latch* bolt, which is moved by contact with it, it is more commonly called a *strike-plate*, as figs. 1254, 1628, etc. They are also further designated by the name of the lock or latch which they accompany.

3. "The latch of a hook, which prevents its accidental disengagement."—*Knight*.

Keg-shaped spiral-spring. Fig. 2050. A spiral spring, the form of which resembles a keg or cask, patented by W. P. Hansell in 1876. Its object is to obtain a *graduated* spring, which see.

Key. 1. "In a *general sense*, a fastener; that which fastens; as a piece of wood in a frame of a building."—*Webster*. Hence a pin inserted in a hole in a bolt, and used to secure the bolt or its nut. A *split-key*, which see, is a special form.

2. Figs. 1011, 1029, 1178, etc. "An instrument for opening or shutting a lock by pushing the bolt one way or the other."—*Webster*. See *Lock*.

The former ring holds tire and wheel together, and the latter ring holds the former in place, filling up the groove in the tire. When both rings are in place the outer tip of the groove in the tire is slightly hammered over, thus gripping the second or key-ring, and retaining it in place. The *Carlton & Stroudley* fastener, which see, is the most used of this class of fastening. See also *Tire fastening*.

King-bolt, or centre-pin. 9, figs. 215-7; 18, figs. 82-83; 16, figs. 182-85. A large bolt which passes through the truck and body-bolsters and centre-plates of a car-body and the centre of a truck. It is accessible from the floor of the car by removing the *king-bolt plate*. The truck is supposed to swivel on the king-bolt, but in reality the two centre-plates normally carry all the strain. In some wrecking cars, as at K, figs. 144-9, the king-bolt is provided with *keys* to bind the truck to the car so that they cannot be separated from each other.

King-bolt key (wrecking cars). K₁ and K₂, figs. 146-148. See above. They are distinguished as the *upper* and *lower* key.

King-bolt plate. 17, figs. 155-85; 10, fig. 215. See above.

King-post (of a truss). 5, fig. 2131, etc. A single post or distance-piece between a *truss-rod* and the *chord* of a truss or beam. If two such posts are used they are called *queen-posts*. In car construction king-posts are made in two ways; one adjustable, so that they may be lengthened or shortened, and the other without adjustment. Also see

Brake-beam king-post. Cross-frame king-post.
Truck-bolster king-post. Truck-frame king-post.

Kirby's car-door lock. Figs. 1003-4. A device to give a lock extra strength and durability and to dispense with the use of screws for fastening on the door-knobs.

Kirtley double-spoke wheel. Figs. 2162-5. A railroad wheel, the hub (boss) spokes and rim of which are composed wholly of wrought iron welded together, the tire being shrunk on and secured by *Mansell retaining-rings*, which see, or other devices. The spokes are rolled in flat bars of varying thickness, and are bent into a triangular form, each triangle ultimately forming two spokes and a segment of the rim. The apexes of the triangles are welded to the hub, and the angles at the base of the triangle are welded together to form a continuous wrought-iron rim. This wheel is an improved form of

that shown on figs. 2179-80, and is largely used on both freight and passenger service in Europe, and to a lesser extent in this country.

Kitchen (dining car). Figs. 193, 211, 214. A large compartment at one end of the car provided with all the facilities of a well-organized kitchen. In the earlier dining cars no cooking was done on the cars, and the kitchen simply had facilities for keeping the food hot. Officers' and other private cars are commonly provided with a kitchen smaller than in dining cars and usually at the extreme end.

Knee-timber (Janney platform). Figs. 543, etc. A deep *platform-sill*, cut away to embrace the end-sill.

Knee. See *Platform-hood knee*.

Knee-iron. An L-shaped or angle-iron casting or forging which is fastened to the corner where two timbers are joined to strengthen the joint. See *Sill knee-iron. Truck knee-iron*.

Knee-strap (Janney coupler). 111, figs. 543, 554. A wrought-iron facing to the knee-timbers, connecting the end-sill and the stirrup or drawbar carry-iron.

Knob. See *Berth safety-rope knob. Door-knob. Window-curtain knob*.

Knob-escutcheon. Figs. 1002, 1025. A *Door-latch rose*, which see.

Knob sash-lift. Fig. 1671. See *Sash-lift*.

Knob-shank. Fig. 1007. A *door-lock spindle*, which see.

Knotted spiral seat-spring. Fig. 1223. One with the loose ends of the wire tied. See *Seat-spring*.

Knuckle. 1. (Janney coupler.) 2, figs. 542-54, 555-601. The rotating coupling-hook by means of which coupling is effected when the knuckle is locked by the Janney catch.

2. (Of a hinge.) Figs. 779-789. The central tubular projections which carry the hinge-pin. The term is of wide and general application in mechanics to many similar parts.

Knuckle-joint. "A joint in which a projection on each leg or leaf of a device is inserted between corresponding recesses in the other, the two being connected by a pin or pivot on which they mutually turn. The legs of dividers and the leaves of door-hinges are examples of true knuckle-joints. The term, however, has been somewhat commonly restricted to compound or universal joints designed to act in any direction."—Knight.

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Ladder-handle. 9, figs. 252-4 ; 60, figs. 86-96 ; figs. 656-7, etc. A *roof grab-iron*, which see.

Ladder-rod. An iron *ladder-round*.

Ladder-round. 2, fig. 9 ; 59, figs. 86-96, etc. See *Ladder*. The lower round of the ladder by recommendation of the Master Car-Builders' Association should be a *bent ladder-round*, as 59', fig. 96, as a safeguard against the slipping of the foot in swinging around the corner of a car.

Ladder side-rails. 202, figs. 97-101. The wooden vertical side pieces to which wooden or iron ladder-rounds are attached. This form of constructing the ladder, however, is less common than ladder-rounds directly screwed to the end of the car, as in fig. 96.

Lag-screw (English, coach-screw). Fig. 1868. An iron bolt with a square or hexagonal head and with a wood screw-thread cut on it, intended to screw into wood. Lag-screws are round under the head, so that they can be turned after they enter the wood.

Lambrequin (lam'-brě-kăn). 28, fig. 695. A cloth or drapery fastened over the upper part of a window. It covers the rod and rings or roller of the window curtains. Lambrequins are unfashionable and passing out of use.

Laminated buffing-spring (English). A half-elliptic

Lamp-alcove. Figs. 855, 864. A metal casing or lining for a recess in the side of a car to contain an *alcove-lamp*, which see.

Lamp-arms. 4, figs. 8274-83, 843; 26, figs. 690-1. Rods by which a lamp is attached to the ceiling of a car. Some lamp-arms, as in fig. 880, have bracket-angles to support the shade and are then called *bracket-arms*.

Lamp-base (Moehring argand lamp). D, figs. 849-50.

Lamp-bottom. Figs. 908-6; 20, figs. 8274-71; E, figs. 849-50. The lower portion of a lamp which is removable. Contains the wick, burner and oil. See *Candle-bottom*.

Lamp-bracket. 17, figs. 851-71, etc. See *Side-lamp bracket*.

Lamp-burner. Figs. 872-925; 8, figs. 8724-71, 878-98. That portion of a lamp by which the opening on the top of the reservoir is closed, which holds the wick, and by which the latter is adjusted. A great variety of styles exist and are shown. See engravings. The *dual burners*, which see, are favorites for car service were a brilliant light is wanted, but many forms are used.

Lamp-burner (English). 165, fig. 205. The wick holder in the *roof-lamp*, which see.

Lamp-canopy. Figs. 940, etc. A larger and more elaborate *smoke-bell*, which see.

Lamp-case (street cars). 74, figs. 1848-4. A box over the end windows in which a lamp is placed. It has a glazed door on the inside and usually colored glass on the outside as a signal or to designate the line to which the car belongs. It is fastened shut by a *lamp-case hook* and *eye*.

2. (English.) 160, fig. 205. A cylindrical sheet of iron for the protection of the *roof-lamp*, which see.

Lamp-case base or packing (English). 167, fig. 205. A wooden packing-piece secured to the roof-boards, and presenting a level face for the *lamp-case*. See also *Roof lamp*.

Lamp-case chimney (street cars). 76, figs. 1848-4. A metal pipe through which the smoke and gases escape from a lamp-case, very similar to a *lamp-jack*, which see.

Lamp-case door (street cars). 75, fig. 1844. See *Lamp-case*.

Lamp-case door-holder. Fig. 1863. A kind of hook attached to the roof.

Lamp-case eye. Fig. 1860. See *Lamp-case*.

Lamp-case hook. Fig. 1860. See *Lamp-case*.

Lamp-chimney. A glass tube which incloses the flame of a lamp, conducts away the smoke and gases and produces the necessary draft.

Figs. 926-986; 10, figs. 8274-871 give what are known as the standard types, of which the following table gives the principal dimensions in inches:

	Ht.	Diameter.				No. in a case...
		Largest.	Top...	Bottom.	Neck...	
1. Same shape as No. 2, For No. 1 or A dual burner.....	7	2½	1½	1½	....	6
2. No. 2 or B dual, Taber, monarch, Alex'n and Rich'd burners....	8	2½	1½	2½	....	6
3. No. 2 or B dual, Taber, monarch, Alex'n and Rich'd burners....	8½	3½	1½	2½	....	6
4. No. 16 postal-lamp (for signal and sperm oils).....	10¾	1½	1½	1½	2½	12
7. Student lamp.....	11	1½	1½	1½	2½	25
8. Astral, brilliant and other argand burners.....	10¾	1½	1½	1½	2½	25
9. No. 16 postal-lamp (for mineral, seal and other 300° oils).....	10¾	1½	1½	1½	2½	25
10. Moehring argand burner.....	11	2	1½	2	....	12
11. Mammoth argand burner.....	12	2½	1½	2½	2½	6
12. No. 2 or B sun burner.....	8	3	1½	3	....	6
13. No. 1 or A sun burner.....	7½	2½	1½	2½	....	6
14. No. 2 or B sun hinge burner....	8½	3½	3	2½	....	6
15. No. 1 or A sun hinge burner....	7½	3½	....	2½	....	6
16. No. 1 or A sun hinge burner....	7½	3½	1½	2½	....	6
17. No. 2 or B sun hinge burner....	8½	3½	....	2½	....	6
18. Same burners as No. 2.....	8½	3½	1½	2½	....	6
23. No. 0 or E sun hinge burner (see cuts Nos. 14 and 16).....	6	3	2½	1½	....	6
24. No. 3 or D dual burner.....	10	3½	1½	2½	....	6
25. Same as No. 2, with larger bulge, fits same burners.....	....	....	....	....	....	6

For names of the various patterns as referred to by number, see engravings.

Lamp-chimney bracket. 12, figs. 857-8. A projecting metal arm attached to the side of a car and carrying a *chimney-holder* by which a lamp-chimney is held in place.

Lamp-chimney holder. 11, figs. 848, 857. See above.

Lamp-chimney reflector. 15, figs. 848, 857. Usually it has a hole in the centre in which the chimney is inserted.

Lamp-cover, or lamp-protector (English). 161, fig. 205

cast-iron cover
a spring-catch
shows the smoke

4, figs. 204-5.

lamp fasten-

The receptacle
on the side of
a carriage, a
circle, which
in use.

contains a case cr
of a lamp cr
r from wind.
in form, in dis-
t the bottom,
round, pear-
e-cone-shaped,

A metal tube
ducting away

block up the lamp aperture in the roof when the lamp is not in its place. See *Roof-lamp*.

Lamp-plug stand (English). 163, fig. 205. A cast-iron stand on which the *lamp-plug* rests when the *roof-lamp* (which see) is in use. Its object is to prevent the lamp-plug bumping on the roof of the carriage when the train is moving.

Lamp-reflector. 14, figs. 828-33, 856. See also *Alcove-lamp reflector*.

Lamp-reservoir. 6, figs. 827 $\frac{1}{2}$, 857, 905-6. The portion of a lamp which holds the oil. Also called *lamp-fount*.

Lamp-ring. 5, figs. 827 $\frac{1}{2}$ -83, 843. A metal ring at the base of a lamp, to which the lamp-bottom or reservoir and lamp-globe are attached. In centre-lamps the ring is supported by the lamp-arms. See also *Creamer's lamp-fastening*.

Lamp-screw. Figs. 914-21. A more elaborate *lamp-hoop*, which see, with a flange.

Lamp-shade. 2, figs. 942-8. A conical-shaped reflector placed over a lamp to reflect the light downward.

Figs. 942-948 give what are known as standard forms, the dimensions of which in inches are as per the following table:

Lantern. Figs. 959-86. A portable lamp, the flame in which is protected from wind and rain by glass, usually in the form of a globe surrounded by wires called *guards*. According to the number of these wires the lantern is called *single*, *double*, or *triple-guard*. The *conductor's lantern*, which see, is one with a large bail, so as to be carried on the arm, leaving both hands free. It is usually provided with a *reflector* above. *Fresnel lanterns*, fig. 936, are little used for railroad service, the various forms of *signal lamps*, figs. 959-73, being generally preferred. *Inspector's lanterns*, which see, are technically understood to be those in which the color of the light can be varied at will. See *Lens*. *Signal-light*.

Lantern and flag holder (Coolbaugh's). Figs. 965-8. A device for displaying signals on rear of trains. See *Flag-holder*. The novelty is the convenience of attachment for either a lamp or flag.

Lard-oil lamp-bottom. Fig. 906.

Lard-lamp screw. Fig. 914.

Lard-oil ratchet-burner. Fig. 918.

Large equalizing-guide (Janney-Miller coupler). 47, fig. 534. See *Equalizing-guide*. *Small equalizing-guide*.

Larry. Figs. 1713, 1730. See *Lorry*.

Latch. The primary sense of this word is—to catch, to close, stop, or make fast; hence, an attachment to a door, window, etc., to hold it open or shut, is called a latch. The ordinary distinction between a latch and a lock is that a lock is closed and opened with a separate key and usually has a square bolt, whereas a latch has no separate key and usually has a beveled bolt which snaps shut automatically by contact with the *keeper* or *strike-plate*. The most exact distinction between a latch and lock seems to be the form of the bolt and not the use or disuse of a key. See *Sash-lock*. Latches named from the use which they subserve are the following, which see:

<i>Berth-latch.</i>	<i>Saloon-latch.</i>
<i>Deck-sash latch.</i>	<i>Sliding door-latch, or lift-latch.</i>
<i>Safety berth-latch.</i>	
<i>Safety grute-latch.</i>	<i>Spring door-latch.</i>
<i>Safety strap-latch.</i>	

A *sliding door-latch* or *lift-latch* has a beveled hook instead of a beveled bolt, but operates upon substantially the same principle. Nearly all forms of latches are *spring latches*. A *night-latch* is a large and carefully

made form of an ordinary latch, which can be opened from the outside by a key. A *capboard latch* is any form of small latch. A *rim-latch*, like a *rim-lock*, is one attached simply to the outside of the door in distinction from a *mortise* or *rebbed latch* (both rarely used), which is boxed into the door.

Lateral motion. A movement sidewise, more particularly meaning, as generally used, a side or *swing motion* (which see) of the bolster of a swing-motion truck, in distinction from the *end-play* of an axle under the journal. A *lateral-motion spring*, which is slipped over a *lateral-motion spring-pin*, is sometimes used to check the lateral movement of such spring bolsters, but this end is more commonly accomplished by splaying the swing-hangers outward.

Lateral-motion spring. 40, figs. 1934, 1937. See above.

Lateral-motion spring-pin. 41, fig. 1937. See above.

Lateral-play. Side motion of any part of a car or machinery; the space left to permit of such side-motion. See *Lateral-motion* (of a truck bolster). *End-play* (of an axle).

Laurie car. Figs. 1713, 1730. See *Lorry car*. The lorry car is often spelled Laurie on the supposition that the car was named after James Laurie, a prominent American engineer in the early days of railroads, but the term is English and very old.

Lavatory. Figs. 203, etc. Another name for a *saloon*, especially when provided with washing facilities; also used, more properly, as another name for a *wash-room*.

Lavatory carriage (English). A passenger vehicle in which two or more compartments have access to a small lavatory, urinal, etc. See also *Carriage*.

Lead car-seal. Figs. 1110-13. Lead seals are either in the form of rivets or buttons. The former now more common. See *Car-seal*.

Leaders (of pile-driver car, which see). 3, figs. 1831-4. The long vertical timbers serving to guide the *hammer* (which see) in its fall. The leaders swing upon *leader trunnions* carried on the *leader-trunnion pedestal*. They are stiffened at some point midway of their length by *top-stringers* 6, *leader-braces* 7, and commonly by *piasters* 5, at the outside which also serve to support the top-stringers. They are connected at the top by *leader cap* and at the bottom by a *leader cross-piece* 8.

er as not to in-

4. See above.
7, figs. 1821-4.

A cross-piece
carrying the
hoisting-gear.
Leader.

diagonal brace
serving to

See *Leader*

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Roy, etc., are
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inferior article. The two are, in the main, used for quite different purposes.

Leather-seat. A *dust-guard bearing*, which see.

Left-chamber cap (air-pump for Westinghouse brake). 30, fig. 299.

Left-hand brace-pocket. See *Pocket*. A right-hand pocket is shown at 40, figs. 132-6. If the brace were on the other side of the post and inclined the opposite way, the pocket would be left-hand.

Left-hand seat. Figs. 1134-5. A car-seat with a stationary back in such a position that the seat-end is on the left side of a person sitting on the seat.

Leg. See *Seat-leg*.

Leg-iron (English). 173, figs. 205-7. See *Step-iron*.

Length (of elliptic springs). The distance from centre to center of *scrolls* when the spring is unloaded.

Lens. Figs. 954-5. An optical instrument for conveying rays of light upon a fixed path or fixed point. Lenses for lanterns consist of three types, *bull's eye*, fig. 956; *semaphore* (a mere modification of the *Fresnel*), figs. 954-5, and the *Fresnel* proper, figs. 957-8, the latter rarely used. Standard sizes for bull's eyes are 2½ in., 5 in., 6 in. and 8 in. The standards for semaphores are 3½ in., 3¾, 4, 4½, 4¾, 5, 5½, 6, 6½, 7, 7½ and 8 in.

owning or contributing the car, and between the same and the sill shall appear the light weight of the car, with such other information as it is found advisable to give in connection with same.

"2d. The doors should have no marks whatever.

"3d. The ends to show the initials of the fast-freight line with the car number (in the fast-freight line series) and the light weight just below them; no other marks will appear on ends of car.

"4th. The half of sides of cars on which the doors do slide to be reserved for advertising symbols or trade-marks where used. The use of profuse lettering in this panel is to be discouraged, however, and it is recommended that only the simplest trade-marks or advertising signs should be used; the capacity of the car to appear near the sill in this same panel."

A resolution was adopted at the 16th Annual Convention, 1882, requesting all railroad companies whose initials are the same as those of other railroad companies to stencil the name of the road in full on some part of the car where it can readily be seen by freight agents.

Lever. "In mechanics, a bar of metal, wood, or other substance, turning on a support called a fulcrum."—*Webster*.

See *Brake-lever*.

Brake equalizing-lever.

Centre brake-lever.

Compression-lever.

Cylinder-lever.

Dead-lever.

Door-shaft lever.

Eccentric-lever.

Floating-lever.

Hand-car lever, or propelling-lever.

Live lever.

Platform-lever.

Release-lever.

Roof-lever.

Thumb-lever.

Tripping-lever.

Uncoupling-lever.

Lever-bracket (Westinghouse freight brake-cylinder). 7, fig. 354.

Lever-faucet. Fig. 1592. A self-closing faucet shut by a spring and opened by the movement of a handle or lever. Also called *telegraph-faucet*. They are called *vertical* or *horizontal* according to the direction of the pipe or opening into which they are fastened.

Lever-frame (hand-car). 17, 18, figs. 1720-3. A wooden frame, shaped somewhat like a letter A, on top of a hand-car, which supports the lever-shaft and lever. In some modern cars, as 13, figs. 724-6, a gas-pipe S-frame is used for working double levers.

Lever-frame cap (hand-car). 18, figs. 1720-3. A short

horizontal piece of timber to which the lever journal-bearings are fastened.

Lever-frame post (hand-car). 17, figs. 1720-3. See also *Lever-post*.

Lever-frame tie-rod (hand-car). 25, figs. 1720, 1723. A vertical rod by which the *lever-frame cap* is bolted to the floor-frame.

Lever-guard (Janney coupler). 116, figs. 542-54. A guide on the platform-rail for the platform-lever.

Lever-guide. See above and *Brake-lever guide*.

Lever hand-car. Figs. 1709-26. The common style of hand-car, which see, worked by levers connected to cranks. These levers are usually placed horizontally, but sometimes they are vertical. *Double-lever* hand-cars, to avoid danger of trouble with the dead-centre, have recently been introduced. See *Hand-cars*.

Lever-handle (hand-car). 20, figs. 1720, 1723.

Lever-jaw (Janney platform). 33, figs. 542-554, 555-601. The cast-iron jaws upon which the *platform-lever* has its fulcrum.

Lever jaw-pin (Janney-Miller coupler). 97, figs. 542-554, 602-35. See above.

Lever-post (Kalamazoo lever hand-car). 1, figs. 1724-6.

Lever-post base (Kalamazoo lever hand-car). 31, figs. 1724-6. A large cast-iron washer.

Lever-shaft (hand-car). 21, figs. 1720, 1722. A short iron shaft to which the *propelling levers* are attached.

Lever-shaft bearings (hand-car). 22, figs. 1720-23.

Lid. See *Journal-box cover*. *Saloon seat-lid*.

Lift. A finger-hold attached to windows and window-blinds to take hold of in raising or lowering them. See *Sash-lift*. *Window-blind lift*.

Lifting-plate (Wolfrath combination sash-lift and lock). M, figs. 1700-2. An equivalent for the ordinary *sash-lift*.

Lifting-spring (Ormsby sash-balance). C, fig. 1703.

Lift-latch, or sliding-door latch. Figs. 990-1, 746-9.

A lock, the latch of which is lifted by turning the knob instead of drawing it backward.

Lift-latch lock. "A lock in which the latch is pivoted and lifted free of the keeper, passing through a notch in the box instead of being simply retracted."—*Knight*. Similar to figs. 990-1, 746-9.

Light. "A window; a place that admits light to enter; a pane of glass."—*Webster*. See *End roof-light*. In

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size.	Total
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60	.011
80	.012
10	.013
30	.014
50	.015
70	.016
15	.017
40	.018
65	.019
50	.020
95	.021

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At the 17th M. C. B. Convention, Chicago, 1883, the following resolutions were adopted:

"Whereas, It is a common practice to store line cars on side tracks during summer months or dull times away from home, after they have been in severe service; and,

"Whereas, Many of the cars after being so stored are found to be more or less out of proper condition, so that they need more or less repairs, and when put into service cause much detention to traffic and many transfers;

"Be it Resolved, therefore, That it is the sense of this meeting that all line cars owned by foreign companies should be returned to their owners instead of being stored on foreign tracks, and that a competent man should be detailed to inspect the stored cars and to arrange to have the necessary repairs made during the time such cars are out of service."

For standard lettering of line cars, figs. 658-9, see *Lettering*.

Lining. See *End-lining. Head-lining. Inside-lining. Feed-door lining.*

Lining guards (Gouge heater). Figs. 1424-5. Ribs fast-

Link-hanger. A *swing-hanger*, which see, in the form of a link.

Link-hanger eye-bolt. Figs. 2113-3. A bolt passing through the transom from which a very short *swing-hanger*, which see, is suspended.

Link-pin ("American" ball-crank steam driver-brake). 19, figs. 833-5. See *Link*.

2. Fig. 1776. A *coupling-pin*, which see.

Linoleum. A form of floor covering manufactured from linseed oil, prepared by a special process, mixed with ground cork and backed with canvas. Another floor covering of substantially the same nature as linoleum is known as *corticine*.

Lintel. 18, figs. 373, etc. The horizontal part of a door or window-frame above the sash. See *Deck-sash lintel*. 5, fig. 186.

Lip. See *Retaining-lip* (steel-tired wheel's).

Lip lamp-chimney. Fig. 936-7. One with an indented ring near the bottom, for use with screw lamp-burners.

Live-lever. 6, figs. 338-9 and figs. 317-3. The one of a pair of brake-levers to which the brakepower is first applied is sometimes given this title, the other being termed the *dead-lever*.

Lock. Figs. 937-1037. "Anything that fastens—particularly an instrument having one or more bolts moved by a key, used for fastening doors, drawers, etc."—*Worcester*. Accordingly, in this dictionary bolts which have a beveled bolt, especially if they do not require a key to move them, are termed *latches*, and those with a square-ended bolt *locks*. See *Sash-lock* and *latch*. According to their purpose locks are divided into *berth-locks*, *door-locks*, *freight-car locks*, *grain-door locks*, *seat-locks*, *sliding-door* or *lift-latch locks*, etc. According to their manner of application, they are distinguished as *mortise locks*, inserted entirely within the door; *rabbeted locks*, visible on the exterior of the door, but boxed more or less into it; and *rim-locks*, entirely exterior to the door. A *dead-lock* is one which has no springs within it but is moved entirely by key; in distinction from a *spring door-lock* or *night-latch*, which is moved by a key from without, but has a beveled bolt so that it snaps shut automatically. A *padlock* is one used with a staple and hasp, and which is not otherwise permanently attached to the opening which it fastens. The *Yale lock*, which see, is a special form largely used. Freight-car locks are

usually *seal locks*. See *Car seal*. See also *Private lock* (English).

Lock-bolt (seal-lock). E, fig. 1011. The bolt which enters the shackle and effects the locking.

Lock-case. Figs. 1039-1037. The outside or covering part of a lock, more especially a padlock.

Lock-chain. 76, fig. 86. A chain by which a padlock is fastened to a car.

Locker. A small compartment or closet for storage. A closet is usually the same height as the room and a locker is of less height. Lockers are frequently attached under cars, as in figs. 53, 56.

Lock-keeper. Figs. 1031, etc. The box on a door-jamb into which the bolt of a lock protrudes when shot. See *Keeper*.

Lock-nut ("American" ball-crank driver-brake). 24, figs. 333-5. (Kirby's car-door lock.) Q, figs. 1038-4. The outer one of a pair of nuts on one bolt, which by screwing up separately to a tight bearing locks the inner one.

Lock-seal. Figs. 1106-19, etc. A piece of glass, lead or paper, which forms a seal for a lock, so that the latter cannot be opened without its being known. See *Car-seal*.

Logging-car. A passenger or box car fitted up with sleeping accommodations for men at work on the line of a rail. More commonly called *boarding-car*.

Logging-cars. Figs. 1737, etc. A special variety of light and strong cars used for getting out lumber, running usually on cheap *logging railroads*, of which a great number now exist.

Long brake-rod (Stevens' brake). 12, fig. 232. A rod which connects two levers, one on each truck, together.

Long brake-shaft. 94, figs. 83, 101. One which extends up above the top of a car so that brakes can be applied by a person on the roof.

Long gondola car. Figs. 81-82. See *Gondola car*.

Longitudinal-seat (street and suburban cars). 34, figs. 1842-4. A seat which extends lengthwise of a car.

Longitudinal-step. Figs. 1839-1841. A board which extends along the side of an open car, or a car with doors on the side, used as a step in getting on or off the car or for passing from one end of the car to the other.

2. (English.) See *Foot-board*.

Longitudinal-step bracket. Figs. 1839, 1841.

and 206. Cor-

A long bolt
together longi-
d if inclined
e to prevent
eight-wheeled
four-wheeled

ne of wood or
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4. A small
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of tests by Reuben Wells in the transactions of the Master Car-Builders' Association, 1870.

Lorenz refrigerator car. Figs. 130-130½. A car which uses salt and ice for refrigerating, and carries the ice in *ice-racks* at the end of the car.

The walls are generally about six inches thick, composed, including bottom, of: (1), the outside siding; (2), *air-space D*; (3), a non-conducting composition sheeting; (4), intermediate lining; (5), non-conducting *cork wall*; (6), inside lining. All the air spaces, except those in bottom, are in free communication with each other. *Air-inlets E*, in end of car, permit free circulation of air in and out of air-jacket; and *floor air-inlets F* perform the same office for air spaces in the bottom. The doors are constructed like the walls.

The floor slopes to centre and is provided with a narrow *trough K*, covered by a *cover-strip L* and provided with *floor-traps N*. *Draining-notches O* permit access of water to the trough. It is of galvanized iron and contains a retaining trap in the centre of its length. A bottom *flashing T* of galvanized iron runs around entire base of walls to prevent access of moisture to the framing.

the brakes are applied the compressed air is conveyed from the tank by pipes connected together between the cars by flexible hose to cylinders with pistons under each car, by means of which the pressure of the air is communicated to the brake-levers and thence to the brake-shoes.

Lower arch-bar. The *inverted arch-bar*. See *Arch-bar*.

Lower bell-crank bracket (American automatic compression brake, which see). 12, figs. 368-9.

Lower-berth (sleeping cars). 1, figs. 676-8. The bed nearest the floor made up by dropping down the seats and seat-backs. The mattress for it is carried by day in the pocket formed by the upper berth. In the Mann boudoir cars, figs. 680-1, the lower-berth intact forms a sofa by day, the sofa-back forming the upper berth. See *Berth*.

Lower berth-curtains (Mann boudoir cars). 13, figs. 680-1. See *Berth-curtain*.

Lower brake-rod. 97, figs. 1907-69; 5, figs. 227-35; 10, figs. 324-5. A rod which connects the two brake-beams or levers of *outer-hung* brakes. When one brake-lever only is used on each truck the rod is attached at one end to the lever and at the other end to the opposite brake-beam. When two levers are used the rod is attached to each lever. It is supported in case of accident by a *lower brake-rod carrier*. See note to fig. 1967. With *inner-hung* brakes the substitute for the lower brake-rod becomes a part in compression and is called the *brake-lever coupling-bar*, 19, figs. 249-51.

Lower brake-shaft bearing. 97, figs. 87-95; 155, figs. 155-7. An eye or support for a vertical brake-shaft, near the lower end. The support at the lower end is called the *brake-shaft step*. The lower bearing is above the step.

Lower-cap (triple valve for Westinghouse brake). 3, figs. 332-3. (Of reducing-valve, West. train signal app's.) 4, fig. 691. (Of Westinghouse engineer's brake-valve.) 11, fig. 334.

Lower-chord (of a truss). 14, figs. 2182-6. The lower outside member.

(The distinction between a lower chord and a truss-rod, in trusses like that represented in figs. 2181, 2193, is not very clear; but a *chord* is usually so called only in a truss having both vertical and inclined members. A mere *trussed beam* is not a truss in modern technical usage.)

Lower cone (graduated bolster-spring). 2, fig. 2096. See *Spiral spring*.

Lower connecting-rod stirrup (American automatic compression brake, which see). 24, figs. 368-9.

Lower corner-plate. 57, figs. 82, 86; 26, figs. 109-12. See *Corner-plate*. A *push-block*, which see, is usually cast on this corner-plate.

Lower or bottom cylinder-head (Westinghouse driving-wheel brake-cylinder). 4, figs. 314-5.

Lower-deck. 171, figs. 159-60. The main roof of a passenger car on each side of the *clear-story* or *upper-deck*.

Lower deflector-frame (Gouge heater). Fig. 1457. A frame inside of the front of case to which the deflector is attached, through which hot air is discharged near the stove.

Lower discharge-valve (air-pump for Westinghouse brake). 32, figs. 298-9. A *puppet-valve*, which see, at the bottom of the air-pump through which the air below the piston escapes.

Lower door-hinge (English). 180, fig. 205. See *Door-hinge*. This hinge is made with a longer butt than the others, to allow for the curvature or *fall-under* of the door.

Lower door-panel. 10, fig. 370.

Lower door-sash. 13, fig. 370. The lower section of a door-sash, which is made in two parts. This is commonly movable, the other fixed.

Lower end-panel (street cars). 30, fig. 1845.

Lower foot-board (English). 171, figs. 205, 207. American equivalent, *platform-step*. A board running nearly the whole length of the carriage, and situated about 20 in. from the ground.

Lower outside-panel (street cars). 28, figs. 1843-4. It is usually made concave.

Lower seat-back rail (street cars). 40, figs. 1843-4. See *Upper seat-back rail*.

Lower side-bearing (logging cars). Figs. 1737, 1762. The *truck side-bearing*.

Lower steam-valve (for engine of Westinghouse brake). 7, figs. 293-9. See *Main steam-valve*.

Lower swing-hanger pivot. 48, figs. 1912, 1917-8, 1959. A bar by which a *spring-plank* is attached to the lower end of a *swing-hanger*, which see.

Lower valve-chamber cap (Westinghouse air-pump, etc.). 34, fig. 298.

Lower wainscot end-rail. 30, fig. 186. See below.

Lower wainscot-rail (passenger car interiors). 74, figs.

the lower one is raised up narrow-way, and thus is raised with the lower one. See *Win-*

on (English). A freight car with sides at 9 in. high. It has generally no doors, chiefly for conveying pig-iron and similar *high-sided wagon*. *Medium-sided wagon*. Wagon constructed so as to bring the floor rails; mainly used in construction service. Wagon constructed so as to bring the floor 6 in. from the rail instead of about 4 ft. Nos. 860-2, etc. An instrument used for lubricant. Also called *oiler*. See *Automatic*

ing stud or ear to afford a bearing or point. See *Follow-plate lug*, fig. 1743.

1 sash-balance. 1, fig. 1707.

1 hemp-packed wheel. Fig. 2166. Projections on the outside of the wheel-centre to receive the hemp packing.

prings. 5, figs 2095-6. Projecting points *up-plates* to enter the timber.

locks (freight-car seal-lock). N, fig. 1011. Lock carrying the pivot of the clasp by which the door is opened.

1 w grain-door. 1, fig. 378.

ard. Fig. 1279.

1869. A *strap-bolt*, which see, with a lug

McKay's curtain brace
form of bracket for holding roller curtains, one brace and the other a circular brace besides those shown.

roller accomplish the work, but the McKay works with a pawl. See **Machine-bolt**. Figs. 1800-1801 cut on it, and with a square if turned or finished. This means a machine-bolt.

Magazine (base burning term for a receptacle for powder proper, usually square). The term is sometimes used from 1800 to 1887, but incorrect.

Magazine-door, inside 10-11, fig. 1473.

Magnetic curtain holder
window-shade fixed in an easily movable. It is running across the top against two fixed bars the window, to which

as those used only for carrying mail-bags and not for distributing mail-matter, but the distinction is not always observed. Distributing mail-cars are, however, always called *postal cars*, which see. See also *Combination baggage car*.

Mail-car lamp. Figs. 856. etc. See *Postal-car lamp*.

Mail-catcher. Figs. 57, 1086. A contrivance consisting of a bent iron bar, attached to the door of a postal car for taking up or "catching" mail bags while the train is in motion. The English system of collecting mail-bags is different from the American, and relies upon the use of nets. The leather bag is fastened by a spring to an iron bar in the car and when the exchanging station is near the bar is turned out, the bag hanging suspended. At the same time, the catching apparatus, consisting of a net attached to a bar, is put out. The bag from the car is caught in a net attached to a stationary post and the bag for the car caught in the car net in a similar manner. The American plan has been copied in Austria and India.

Mail van (English). A vehicle adapted to run on passenger trains and fitted with apparatus for sorting and conveying letters, and generally with apparatus for taking up and dropping mail-bags while the train is at full speed. A mail van in which letters can be posted and letters are postmarked is termed a *traveling post-office*. When fitted only for conveying mail-bags and not for sorting, it is termed *mail-car tender*. Every projecting piece of either wood or metal is carefully padded to prevent injury to the post office officials in collisions, etc.

Main-bottom (Johnson heater). 21, fig. 1472.

Main-cap of triple valve (Westinghouse brake). 3, figs.

833-3. A screw-plug in the lower end of the chamber which contains the triple-valve piston.

Main-carline (freight cars). 82, figs. 89-96. A carline stronger than the ordinary carlines, so as to support the roof and tie the two plates together.

Main-cock (for low pressure gas, Pintsch gas-lighting apparatus). Figs. 820-1. A cock usually placed in the saloon for the control of the low-pressure supply. It regulates all the burners at once, in addition to which there are separate cocks to each.

Main draft-spring (Janney). 28, figs. 542-554, 555-601. So called in distinction from the *auxiliary draft-spring*

27 behind it. The *centre buffer-spring* lies above both. **Main-pipe (Westinghouse brake).** Fig. 826. The *brake-pipe*.

Main-rafter. A *main-carline*, which see.

Main-reservoir (Westinghouse brake). 1, figs. 297-9, 294-300. A cylindrical boiler-plate tank, carried on the locomotive, under the foot-board, to hold a supply of compressed air. So called in distinction from the *auxiliary reservoirs* under each car.

Main-sheave (pile-driver car). 10, figs. 1831-4. The sheave at the top of the leaders over which the *hoisting-rope* passes.

Main steam-valves (Westinghouse brake-pump). 7, fig. 298; 14, fig. 299. Two piston valves admitting and exhausting steam above and below the main piston. The upper is of larger diameter than the lower, both being rigidly connected by a rod, so that the pressure of steam (always between them) keeps them in the highest position, admitting steam above the main piston and exhausting from beneath it. At the end of the stroke they are moved downward by steam being admitted above the *reversing piston* by the *reversing valve*, which see. They are usually called simply *main-valves*.

Main-top (Johnson heater). 23, fig. 1472.

Main-valve, upper and lower (Westinghouse air-pump, etc.). 7, fig. 298, and 14, fig. 299. The *main steam-valves*, which see.

Male centre-plate. The body and truck centre-plates are sometimes called male and female. See *Centre-plate*.

Malleable iron. Castings whose brittleness has been removed by packing them in powdered hematite (peroxide of iron) in tight fire-brick cases and subjecting them to a continued red heat for about a week. They are then allowed to cool slowly. The oxygen of the hematite combines with and removes a part of the carbon of the iron, making the castings almost as tough as wrought iron, but they are ordinarily not truly malleable, or capable of being rolled or forged. Malleable iron is much used for pipe fittings and similar small castings, and even for brake-shoes.

Mammoth lamp-chimney. Fig. 929. See *Lamp-chimney*.

Mandrel. 1. (For lathes.) A shaft serving as a temporary axis for objects to be turned.

2. (Foundry.) A plug around which a body of metal is cast.

anger). 4, figs.
ring-plank. See

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rings fitting into grooves in the tire, and bolted to the
teak blocks. This wheel is almost universally used in
English passenger service.

Marden's brake-beam. Figs. 255-6. A brake-beam, brake-
head and clamp, patented by A. H. Marden, of Charles-
town, Mass. The beam is a steel deck-beam. The
malleable iron head is adapted to several forms of shoes,
and is fastened to the beam by a slot in the lower edge
of the T flange. The head is cored out, and when in
position over the slot in the beam a wrought-iron key is
driven in, which lifts the head into the slot and so
secures it. The key is made tapering at one end, with a
half head at the other end. The malleable-iron brake-
lever fulcrum fits the T flange of the beam and is kept
in place by a bolt. The brake-beam, with its attach-
ments complete, weighs 96 pounds.

Marking (cars). See *Lettering*.

"Marlborough" basket-rack. Fig. 698. See *Basket-
rack*.

Marshaling (English). American equivalent, *switch-
ing* or *drilling*. Arranging the cars of a freight train in
proper station order.

Mason's rocker car-seat. Figs. 1123-28. A seat having
rockers resting on a concave support by which the seat

Dead-blocks. Fig. 405-7.

Dictionary (back of title-page).

Distance-gauges between flanges. Fig. 1996.

Drawbar attachments and dimensions. Figs. 401-4.

Draw-springs, capacity of.

Height of arawbars. Fig. 406.

Interchange of cars, rules for. (These latter not prepared by the Car-Builders' Association acting as such.)

Journal-bearing and journal-bearing key. Figs. 1982-92.

Journal-box. Figs. 1997-2001.

Ladder and grab-iron attachments. Figs. 656-7.

Limit-gauges (for round iron). Figs. 1825-6, 1829.

Line cars, storage of.

Lettering for line cars. Figs. 658-9.

Pedestal. Figs. 2021-4.

Running boards. Figs. 656-7. (The size of iron specified should read $1\frac{1}{2}$ by $\frac{1}{2}$ in., not 2 by $1\frac{1}{2}$ in.)

Screw-threads. Fig. 1834.

Wheel and axle-gauges, consisting of the following:

Centering-gauge. Fig. 2114.

Circumference-measure. Figs. 2119-20.

Diameter testing-gauge. Fig. 2123.

Flange and journal gauge. Fig. 2128.

Flange distance (inside to inside) gauge. Fig. 1996.

Guard-rail gauge. Fig. 2117.

Journal distance-gauge. Fig. 2118.

Journal length and diameter gauge. Fig. 2116.

Journal shoulder-gauge. Fig. 2115.

Wheel-bore testing-gauge. Fig. 2121.

Wheel-tread.

Master-key. "A key which commands many locks of a certain set, the keys of which are not interchangeable among themselves. While neither one of a series of keys may suffice to open any lock, besides the one for which it is constructed, a master-key is one which may operate any one of the set."—*Knight*.

Mast-pocket (wrecking car). 20, figs. 77-8. A heavy casting under the car supported by a *derrick truss-rod* serving as a socket for supporting the mast of a derrick to hold it upright. Another method of supporting the mast is by a large *base-plate* (D, figs. 151-3) bolted to the floor of the car.

Mast-sheave (of a derrick or crane). E, figs. 151-3. A sheave or pulley-wheel placed at the top of the mast.

Mat. Figs. 806-7. See *Floor-mat*.

Match-lighter. Figs. 1038-9. A *match-striker*, which see.

Match-striker. Fig. 1038. A metal plate with a rough surface.

Match-striker frame. Fig. 1039. A metal frame for holding a piece of sand-paper.

Matting. See *Cocoa matting*.

Mattress (Mann boudoir cars). D, E, figs. 680-1. In ordinary sleeping cars both mattresses are stowed away by day above the upper berth. In the boudoir cars they go in boxes under the seats.

Mattress-box (Mann boudoir cars). J, figs. 680-1. See above.

Meat timbers (refrigerator car). The vertical and horizontal timbers inside the refrigerating chamber on which the meat is suspended. They are usually independent of the framework of the car and fastened to it with coach screws.

Medium-sided wagon (English). Figs. 116-19. American equivalent, *four-wheeled gondola car*. A vehicle for freight service, with sides and ends about 80 inches high, and no roof. The doors are generally arranged as shown, but often extend the whole depth, and sometimes the whole length and depth of the side. About half of all the freight cars in England are of this variety, a *tarpaulin*, which see, being used to protect the freight from the weather. See *Low-sided wagon*. *High-sided wagon*.

Melon-shaped lamp-globe. Fig. 950. See *Lamp-globe*.

Metal screw-thread. A form of screw-thread used when both the male and female screws are made of metal. Metal threads are made of the same size as the spaces between them, whereas the spaces between wood screw-threads are made wider than the projections. Metal threads are shown in figs. 1865-7, 1827-33. See also *Sellers system of screw-threads*.

Metal-seal. Figs. 1106-19. See *Car-seal*.

Micrometer gauge. A general term for any form of gauge giving very minute and exact measurements. There are several varieties; the most common is one with an accurate screw-thread and an index to give the number of revolutions and fractions thereof.

Middle corner-plate. 56, figs. 82-86. See *Corner-plate*.

Middle door-panel. 11, fig. 370. See *Door-panel*.

Middle door-rail. 148, figs. 158-55; 6, fig. 370. A horizontal bar intermediate between the top and bottom rails. See *Door-frame*.

Middle longitudinal (English). 5, figs. 116-119 and 206. American equivalent, *intermediate sill*. A part of the *underframing* supporting the body or floor, and in many cases transmitting the buffing and the draft strains.

Middle of axle. A, figs. 1974-5. The portion of a car-axle

come next to the

52, fig. 1969. A
to hold the centre

1, fig. 1969. The
distinction from the
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beams to be con-
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milk in cans, usu-
uggage cars, and
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Figs. 636-43. An
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ee) is one of the

figs. 555-601. The hook used to convert the Janney coupler to the Miller.

Miller stop (Janney-Miller coupler). 43, figs. 554, 555-601.

Miller stop-bolt (Janney-Miller coupler). 56, figs. 554, 602-35.

Mine-car. Fig. 26. A small car for carrying minerals in mines, usually four-wheeled.

Mineral wool. A substance having much the appearance which its name implies, manufactured from the slag of iron furnaces by throwing against it while in the molten state a strong blast of air. It is used for *deadening* in passenger cars and also largely as a non-conductor for coating steam-pipes and boilers.

Minot heating burner. Fig. 902. See *Heating-burner*.

Mirror (for wash-rooms of sleeping cars). Fig. 1570. A looking glass.

Mirror-frame spring. Fig. 1257. A *Mirror-sash holder*.

Mirror-guard (wash-rooms, etc., of sleeping cars). Figs. 1531-7. A fender of various forms to protect mirrors. Usually nickel-plated bars across the face, fig. 1587, and a tray for towels or brush and comb at the bottom of the mirror.

Mirror-panel (Mann boudoir cars). 3, figs. 680-1. A panel

ratchet-bolt engages, holding the sash fixed in any one of four different positions. See *Deck-sash pivot*.

Monitor-top. A clear-story, or upper deck, which see.

Monkey-tail (window-button). Fig. 1658. Also called L window-button, which see. Little used.

Monkey-tail stop. Fig. 1662. A form of *sash-stop* for monkey-tail window-buttons.

Morgan's automatic deck-sash pivot. Figs. 1618-21. A device for regulating the openings of deck-sashes, the essential feature of which is the use of a double circular undulating ratchet, one attached to the sash and the other to a fixed part of the car, the two ratchets being pressed together by springs so as to admit of easy motion of the sash by hand at the same time that it is held in any position when released.

Mortise-lock. Fig. 998. "A lock adapted to be inserted into a mortise in the edge of a door, so as only to expose the selvage or edge-plate."—*Knight*. See *Lock*.

Mould. See *Chill-mould*.

Moulding. 1 to 15, figs. 1050-64, and many other engravings throughout the volume. "A mode of ornamentation by grooved or swelling bands or forms, following the line of the object."—*Knight*. Small mouldings are often termed *beads*, and also *fillets*. A cove moulding is one of concave section. There are a great variety of other special technical terms for different forms of mouldings. Mouldings are either straight or *waved*, which see.

See also *Deck eaves-moulding*. *Window cove-moulding*.
Eaves-moulding. *Window-moulding*.
Platform-hood moulding. *Window-sill moulding*.

2. (For car-seats). Figs. 1199-1204. Also called *Seat-back bands* or *seat-moulding*. A metal band to finish the edge of the seat-back. Plush or leather-covered strips are also used.

Moulding-joint cover. Fig. 1697; 9, figs. 692-3. A piece of wood or metal in some ornamental form for covering the joints of two pieces of moulding. See *Window-moulding joint cover*.

Mouth-piece (Gouge heater). Fig. 1458. The part to which the feed-door is connected.

Movable foot-rest (car-seats). 8, fig. 1120. More properly, simply *foot-rest*, which see; in distinction from fixed *foot-rails* under the seats.

Movable grate (Gouge heater). 1, fig. 1407. The circular central grate inside the *fixed grate*.

Muck-bar. "Bar iron which has passed once through the rolls. It is usually cut into lengths, piled, and rerolled."—*Knight*. Certain grades of iron axles are made directly from muck-bars and contain no scrap. See *Axle*.

Muffler (Eames vacuum brake). A device to render noiseless the emission of steam at the ejector when brakes are applied. It is simply a lot of beads or shot, through the interstices of which the steam forces its way.

Muley-axle. Fig. 1976. An axle without collars. Little used.

Mullion. A slender bar between panes of glass or panel work. See *Door-mullion*, 2, fig. 870; *Window-blind mullion*, 15, figs. 692-3; *Window-mullion*, 146', fig. 158.

Muntin. A corruption of the word *mullion*, chiefly used in England. See *End-stanchion* or *muntin*.

N

Nail. "A small pointed piece of metal, usually with a head, to be driven into a board or other piece of timber, and serving to fasten it to other timber."—*Webster*.

The common nails of commerce are divided into *cut nails* and *clinch nails*, which see. They are distinguished in size by the number of pennies, as 10d., 20d., etc., *nails*. Other varieties, which see, are *eyelet-nails*, fig. 805; *head-lining nails*, fig. 1045; *solid-leather nails*, figs. 1045†, 1230. See also *Panel-pin* (English).

Name-panel. 72, figs. 169-81. A panel, usually of elliptical form, on the outside of a passenger-car body below the windows, on which the name or number of the car is painted. They are not now usual.

Name-plate (Cowell coupler). 12, fig. 538. (Gouge heater.) 88, fig. 1412. See *Door name-plate*.

Narrow gauge. The distance in the clear between the heads of the rails of a railroad when less than 4 ft. 8½ in. See *Gauge*. What may be called the standard narrow gauge is 3 ft. In India and elsewhere the *meter gauge*, 3 ft. 3½ in. is the standard narrow gauge. Less frequently 3 ft. 6 in. is used, as sometimes 4 ft., etc. The narrow gauge at the present time seems to be passing out of use, its assumed advantages not being founded on fact.

Narrow-tread wheel. A wheel with the ordinary width

Wheel. Car-

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-*Knight*. The
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truss-rods are

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any other, be-
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fig. 224, which

burner so formed as to produce a sufficiently intense draft to avoid the production of smoke without the use of a chimney. Certain *mechanical* burners by means of fans actuated by clock-work do this very effectually, but in general the light is comparatively dim, owing to poor draft.

Nosing. 1. (Of a lock.) 8, figs. 987-99, etc. A *keeper*, which see.

2. (Of a stairs.) 2, fig. 686. The part of a tread-board which projects beyond the *riser*.

Notice-plate. Figs. 765, 1071, 1099, and in place, 3, fig. 370. Varieties are the *platform* notice-plate, *saloon* notice-plate, etc. See *Name-plate*.

Nozzle. See *Tank-nozzle*.

Number. Fig. 1233. See *Berth-number*.

Number-panel. Fig. 49, etc. See *Name-panel*. Now rarely used on modern cars. The number is simply painted on between horizontal bars, as in fig. 48.

Nut (standard sizes for). 1, figs. 1865-7; fig. 1834. "A small block of metal or wood containing a concave or female screw."—*Webster*. Nuts take their name from the bolts, rods or other parts to which they are attached. They are usually either square or hexagonal. A *spanner nut*, which see, is one with eight or more sides. They

- under side of the journal by means of a worsted pad held lightly against the journal by spiral steel springs. See *Axle-box cover*, and *Grease axle-box*.
- Oil-box.** A *journal-box*, which see.
- Oil car.** A car made especially for the transportation of mineral oil. Some oil cars are built like stock cars, for carrying barrels of refined oil. Crude oil, and sometimes refined also, is carried in *tank-cars*, which see, figs. 22, 130-42.
- Oil-cellar.** 28, fig. 2011. A cavity in the lower part of some exceptional forms of journal-boxes for collecting the oil and dirt which runs off the axle at the dust-guard. The oil-cellar is *below* the space occupied by the axle-packing.
- Oil-cup.** 20, fig. 811; 40, fig. 298. 1. (Air-cylinder of Westinghouse brake.) A small metal cup attached to an air-pump to hold oil for lubricating an air-piston.
2. ("American" steam brake-valve.) 12, figs. 360-2.
- Oiler** ("American" steam brake). Figs. 360-2. See also *Automatic lubricator*.
- Oiler-tee** ("American" steam brake-valve). 11, figs. 360-2.
- Oil-lamp.** Figs. 908-25. A cheap metal lamp for burning lard or whale oil. A lamp for mineral oil is an oil lamp but generally not so termed.
- Oil-screws.** Figs. 911-23. Fittings for *oil-lamps*, which see.
- Oil-tester.** Fig. 895. A device for testing the temperature of the flashing and igniting points (so called) of illuminating oils; the temperatures, namely, at which a temporary or permanent blaze takes place when a lighted match is held near the surface of the oil. The *outer reservoir* of the oil-tester is filled with water, and the oil to be tested is put in the *oil-pot* and heated to the temperature desired as indicated by a thermometer.
- Oil-tube** (of student lamp). F, figs. 852-4. The vertical tube in which the wick lies. The horizontal bar is the *feed-tube*.
- One-horse street-car.** Fig. 1840. Also called *bob-tail street-car*. See *Street car*.
- Open-door stop.** 71, figs. 182, 186, 82, 87, 93. A block of iron or wood fastened to the side of a freight car to prevent a sliding-door from sliding too far when opened.
- Opener.** See *Deck-sash opener*. *Ventilator-opener*.
- Open link for Miller hook** (Janney-Miller coupler, which see). 98, figs. 554, 602-35.
- Open-mouth drawbar.** Figs. 448, 458-60. A *Safford* drawbar, which has the head cut away at the sides. See *Drawbar*.
- Open plate-wheel** (street cars). Figs. 2139-40. A light cast-iron *single-plate* wheel, with openings cast in the plate between the ribs. See *Wheel*. *Car wheel*.
- Open return-bend** (pipe fittings). Fig. 1841. A short cast or malleable iron U-shaped tube for uniting two parallel pipes. It differs from a *close return-bend* in having the arms separated from each other.
- Open wagon** (English). Figs. 116-119. American equivalent, *four-wheeled gondola car*. A vehicle with sides and ends from 6 in. to 5 ft. high, and having no roof suitable for the conveyance of freight. A *tarpaulin*, which see, is used to protect the freight from the weather. See also *Wagon*.
- Operators' train-order target lamp.** Fig. 971. A kind of lantern with four large semaphore lenses. The name is inappropriate, as many styles are used for this purpose. See *Signal-lamp*.
- "Opposition" sun-burner.** Fig. 886. See *Sun-burner*.
- Ore-car.** A car made especially for carrying iron or other ores. Ordinary gondola cars, which are sometimes lined with sheet iron, and drop-bottom and tip cars are also used for this purpose.
- Ormolu.** Literally, *ground gold*, a style of bronzing metallic surfaces.
- Ormolu hook** (postal cars). Fig. 1074. A kind of pouch-hook.
- Ormsby sash-balance.** Figs. 1708-7. A device to do away with sash-locks or other equivalent devices by means of a coiled spiral spring placed within a small gear-wheel which engages with a *beveled rack* affixed to the window casing. The bevel of the rack is so shaped as to tend to throw the sash outward and toward the other side, thus preventing rattling. A *detent latch* is provided to hold the spring from uncoiling when the sash is removed, and to enable it to be adjusted to the right tension.
- Ottoman.** Fig. 1164. A carpet-covered movable cushion serving as a foot-rest.
- Outer cone** (graduated bolster-spring). 3, fig. 2095. See *Spring*. *Spiral spring*.

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Outside magazine-door (Johnson heater). 10, fig. 1472.
 See *Magazine*.

Outside-panel. 67, figs. 155-85; 27, figs. 1843-4. A panel
 in the outside of a passenger or street car *under* the win-
 dows. Those between the windows are called *outside*
window-panels. Above the windows comes the *frieze* or
letter-board. Street cars have *lower* outside-panels, be-
 low the outside panels proper.

Outside-sills. 25, figs. 1821-4, etc. The *side-sills*. See
Sills.

Outside sleeve-collar (Kirby's car-door lock). D, figs.
 1003-4. See *Sleeve*.

Outside top (Bissell heater). Figs. 1352-4, 1378-80. The
 upper cast plate on which the stove-pipe fits. There is
 also an *inside top*.

Outside top-plate (Spear heater). 10, figs. 1486-90; figs.
 1493-5, 1514-6. The top of the outside casing.

Outside transoms (six-wheeled trucks). 22, fig. 1969. The
 two transoms farthest from the centre of the truck, in
 distinction from the *middle* transoms.

Outside wheel-bars (iron six-wheel truck). A, figs. 1971-3.
 The iron substitute for wooden wheel-pieces.

Outside wheel-piece plate. 11, figs. 1968-9. An iron plate
 fastened to the outside of a wheel-piece to strengthen it.

hung door. Over-hung doors are almost universal for freight cars. See *Door-hanger*. *Car-door hanger*.

P

Package-rack (drawing-room cars). Figs. 699, etc. A small rack analogous to the basket-racks of ordinary passenger cars and the only substitute therefor used in drawing-room cars. It is placed between the windows, within easy reach of the hand, and not above them.

Packing. 1. *Journal-packing*, which see.

2. (Atwood hemp-packed wheel, which see.) C, fig. 3167. A mixture of hemp and vaseline put in with a steam hammer.

Packing-blocks. 1. (Hoit draw-gear.) 7, figs. 426-427; 186, figs. 118-5. Rectangular blocks gained into the centre-sills and *double-spring drawbar timbers*, and serving the purpose of connecting them firmly together longitudinally. The term is borrowed from bridge work, in which the form of packing-block shown is very common. The bolts passing through the packing-blocks are termed *packing-bolts*.

2. (Thomas steel-tired wheel, which see.) Figs. 2174-6. Truncated triangular blocks of wood forced into *pockets* in the skeleton against which the tire bears.

Packing-block pockets. Figs. 2174-6. (Thomas steel-tired wheel, which see.) See also above.

Packing-expander (Westinghouse brake). 12, fig. 814, etc., etc. A spring or other contrivance for spreading out the packing of a piston or valve so as to make it fit air-tight. See *Piston packing-expander*.

Packing-gland. See *Piston-rod*.

Packing-leather. 1. (Of journal-boxes.) Figs. 1997-2020. A *dust-guard* is sometimes called packing-leather.

2. (Westinghouse brake.) 11, figs. 814, etc., etc. A ring of leather used in connection with pistons or other movable parts of machinery to make a steam-tight joint. When so used it is always accompanied with a *packing-leather expander*. A packing-leather for a piston-rod is called a *cup-leather*, and is compressed by a *piston-spring*. See *Piston-packing leather*. *Piston-rod packing-leather*.

Packing-nut (Westinghouse brake). See *Piston-rod packing-nut*.

Packing-nut wrench (Westinghouse brake). 50, fig. 811. See *Wrench*.

Packing-ring (Westinghouse brake). 12, 13, figs. 298, etc., etc. See *Piston packing-ring*. See also *Rubber packing-ring* (for triple valve).

2. ("American" steam driver-brake.) 4, fig. 858-9. The usual type of *piston packing-rings*, which see.

3. (Hose-coupling, Westinghouse brake.) 4, figs. 327-8. An india-rubber ring in a coupling-case, which forms a seat for a coupling-valve, and makes a tight joint between the two parts of the coupling.

Packing-ring washer (hose-coupling, Westinghouse brake). 3, figs. 327-8. A circular metal ring which rests on the *packing-ring*, and forms a bearing for the projections on the *coupling-cap* by which the packing-ring is held in place.

Packing-spring (for piston-rod of Westinghouse driving-wheel brake-cylinder). 8, figs. 814-5. A spiral spring clutching the *piston-rod cup-leather*, and pressing it air-tight against the piston.

Padlock. Figs. 1029-37. A loose lock having a semi-circular *shackle* jointed at one end so that it can be opened, the other end of the link being locked when desired by the entrance of the *sliding-bolt* into it. Such locks are used to secure a *hasp* or the like on a *staple* or similar device by passing the link through the staple. A *spring padlock* is one which snaps shut and locks by pressure only. A *dead padlock* has no springs.

Padlock-hasp (car-door fastener). B, figs. 1106-9. See above.

Padlock-hole (car-door fastener). 4, fig. 1109.

Paige steel-tired wheel. Figs. 2169-71. A type of steel-tired wheel of recent introduction, the hub and skeleton (*wheel-centre*) being in one piece, and the tire secured thereto by *front* and *back face-plates*, *hub-bolts* and *tire-bolts*. It has no retaining-ring.

Painting (of passenger cars) consists usually of the *priming*, *rough-stuff* or *scraping-filling coats*, *color coats* and *varnishing*, all of which see. The care and expense devoted to the process and the order and number of the various coats are often varied, but the following is among the most approved processes, and the order of the coats

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panels, fig. 370, in passenger-cars are usually only the *middle* and *lower* or *twin* door-panels. The upper door-panel is usually of glass. *Window-panels* come *between* the windows and are distinguished as *outside* and *inside*. *Wainscot-panels* come below the windows between the upper and lower wainscot rails. Other interior panels are *deck-side panels* and *end-panels*, the latter sometimes called *ventilator-panel*, and the *end-roof panel* over the door. The exterior panels are the *end-panel* below the windows and the *end-window panel* alongside of the window. A *name-panel*, which see, has been formerly much used, but is now becoming obsolete. In street cars additional panels to those above named are an *upper-end panel*, which also sometimes occurs in passenger cars, a *lower outside-panel* below the outside panels proper; *inside frieze-panels*, *end-seat panels* and *door-case seat-panels*, and *top-panels*.

2. (Of a truss.) The space between two vertical posts or braces and the two chords of a truss. The distance *a, b*, figs. 2185-6, is a panel.

3. (English.) In a carriage, the outside sheathing of the body. Teak and mahogany are generally used for this purpose in England, and sheet-iron on the continent of Europe. See *Bottom door-panel*. *End-panel*. *Quarter-*

piece of wood or metal with which the joint between two panels, or a panel and a post, on the outside of a car, is covered.

Paper-hook (for saloons). Fig. 1095. A hook for carrying closet paper in sheets. A carrier for perforated continuous-roll paper, in large and increasing use, is not shown.

Paper seal-holder. Fig. 1015. A style of seal-holder of which several patterns exist, in which a sheet of paper or printed label is used to protect the lock against unauthorized opening. The paper is usually protected by glass.

Paper wheel. More properly, *Allen paper wheel*. Figs. 2159-61. A car-wheel with a steel tire and a centre formed of compressed paper held between two plate-iron *face-plates*. It is in large and increasing use. The compressed paper can be turned and polished like the hardest wood.

Paragon spiral-spring. Figs. 2063-4. A spiral car-spring made of a bar of metal whose section resembles a figure 8, wound on a mandrel edgewise. It is practically obsolete.

Parallel brake-hanger. 15, figs. 236, 246-51. A link attached to a brake-beam so as to cause the latter and the brake-head and shoe to maintain the same relative positions when the brakes are released, so as to prevent the ends of the brake-shoes from coming in contact with the wheel when the brakes are released. It is attached to the truck-frame *end-piece* by a projecting *parallel brake-hanger carrier*, and to the brake-beam by an *eye*.

Parallel brake-hanger carrier. 16, figs. 236, 245, 249, 251. See above.

Parallel brake-hanger eye. 17, figs. 236, 245-51. See above.

Parcel-net (English). 194, figs. 204, 205. American equivalent, *basket-rack*. In a carriage, a netting placed transversely above the seats for the purpose of carrying light baggage, parcels, etc. The front edge is attached to a wooden bar called the *parcel-net rod*, which is supported by a *bracket*.

Parcel-net bracket (English). 193, figs. 204, 205. See above.

Parcel-net rod (English). 192, figs. 204, 205. See above.

Parcel-rack. See *Basket-rack*, figs. 696-701.

Parcel-van (English). American equivalent, *express-car*.

A closed vehicle adapted to run on passenger trains and to carry parcels and packages, rather than passengers' baggage. Such business in England is done by the railway companies themselves, and not by separate corporations.

Parliament-hinge. Fig. 786. See *Hinge*.

Parlor car. Figs. 52-3, 210-11, 695, etc. See *Drawing-room car*. The names *parlor car*, *drawing-room car* and *chair car* are all used somewhat indiscriminately, but *chair car* ordinarily refers to a parlor car with adjustable chairs, for riding in which no extra fare is charged. Parlor and drawing-room cars are usually run by separate companies. See *Bay-window parlor car*, fig. 210, and frontispiece.

Parlor-car chairs. Figs. 1154-66. The most common type of chair for parlor cars is a simple arm-chair revolving on a *pivot* which enters a fixed *pedestal*. The *Hartley* and *Horton* chairs, which see, have for some reason been mainly confined to a class of parlor cars run without extra charge as ordinary first-class passenger coaches. See above.

Parlor-car water-closet (Howard's, which see). Figs. 1067-9.

Parting-bead, or parting-strip. 16, figs. 692-5. A long thin piece of wood which acts as a distance-piece between two objects, as a window and a window-blind. See *Sash parting-strip*.

Parting-rail (of door frame, which see). 7, fig. 870. A vertical rail between the bottom and middle or middle and top rails of a door or partition, dividing a panel into *twin-panels*.

Partition (English). 130, figs. 204, 206, etc. A vertical division dividing the interior of the body into separate compartments, generally extending completely across the vehicle from side to side, and from floor to roof, but occasionally made to extend only some four or five feet from the floor, leaving a clear space between the top and the roof. This practice is, however, going out of favor.

Partition-stop (for door-holder). Figs. 763, etc. So called in distinction from a *floor-stop*, with which a *door-holder*, which see, engages.

Partition-wall (Mann boudoir cars). 16, figs. 680-1. The wall between the separate boudoirs.

Passenger car or coach. Figs. 48-9, 62-3, 154-214. See

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Paul flexible window-blind. See note to fig. 1645. A device to enable the window-blind to be made in one piece and to slide up when raised into a pocket under the roof. It consists essentially of slats with alternate concave and convex edges united by a strip of spring brass. See *Wilson flexible window-blind*.

Pawl. 1. (For brake ratchet-wheel.) 2, fig. 241; 8, fig. 254, etc. "A pivoted bar adapted to fall into the notches or teeth of a wheel as it rotates in one direction, and to restrain it from back motion. Used in windlasses, capstans and similar machinery."—*Knight*.

In most of the English dictionaries *ratchet* is given as another name for pawl, but this is believed to be incorrect, according to present practice. See *Ratchet-wheel*.

2. (For ratchet-wheel of winding-shaft.) 131, fig. 105. See above.

Pear-shaped lamp-globe. Fig. 952. See *Lamp-globe*.

Pedestal. 1. 5, figs. 1942-7, 1955-69; 18, figs. 2002-3. M. C. B. standard, figs. 2021-4. A casting of somewhat the form of an inverted letter η bolted to the *wheel-piece* of a truck-frame, to hold the journal-box in its place, while permitting a vertical movement. The two projections of a pedestal are called *pedestal-horns*, and the space between them a *jaw*, which is closed at the bottom by a *jaw-bit*, which see. In Great Britain pedestals are

Pedestal-spring. Fig. 2091. (Coal cars.) Fig. 2093. (Street cars.) Fig. 2089. A *journal-spring*, which see.

Pedestal stay-rod. 167, figs. 102-8, 143; 7, figs. 1968-9. A transverse rod connecting the pedestal tie-bars on each side of a truck so as to prevent them from spreading apart.

Pedestal tie-bar. 168, fig. 102; 6, figs. 1907-70, 2025-80. An iron bar or rod bolted to the bottom of two or more pedestals on the same side of a truck or car, thus holding or tying them together. The pedestal tie-bar is sometimes curved downward and called *bottom arch-bar*, as in fig. 1788, and sometimes given a half-turn for additional stiffness, as in fig. 1918. It is also sometimes combined with a *pedestal brace* to form a *pedestal brace-tie-bar*, which see.

Pedestal-timber. 1. (Four-wheel cabooses, etc.) 169, figs. 102-4. A longitudinal timber sometimes used on four-wheeled cars, which is placed under the floor or alongside the sill and to which the pedestals are bolted.

2. 10, figs. 1941-70. A term sometimes used to designate the *wheel-piece* of trucks, which see.

"Penfold" card-rack (freight cars). Fig. 1048. A rack for carrying *destination cards*, which see.

Perch. 26, fig. 143. Another name for the draw-timbers of a tip-car, on which the floor is not directly built. The name comes from the *perch* of wagons connecting the front and hind running-gear. See *Car perch*.

Perforated inside-top (Johnson heater). 24, fig. 1472. (Bissell heater.) Fig. 1383.

Perforated-rubber floor-mat. Fig. 806. Another style is the *corrugated-rubber floor-mat*.

Perforated smoke-pipe casing. 9, fig. 1489. An outside pipe which incloses the smoke-pipe of a stove, perforated with holes through which the air circulates, and thus comes in contact with the pipe. The casing also protects the wood-work of the car from radiated heat.

Perforated veneer. Figs. 1181-9, etc. A form of seat-covering which consists of three and sometimes four layers of wood veneering, glued together and perforated with holes for ornament and ventilation. It is in very general use for the seats of second-class and smoking cars.

Phosphor-bronze. "A term applied to any alloy of bronze or brass (which see), or to a triple alloy of copper, tin and zinc, which has been given special purity and excel-

lence by skillful fluxing with phosphorus. It is supposed that the presence of phosphorus gives the tin a crystalline character which enables it to alloy more completely and strongly with the copper. Whether for this reason or not, the phosphor-bronzes, when skillfully made, are greatly superior to unphosphorated alloys."—*Hurston*.

Piece.

See *Centre-piece*.
Distance-piece.

End-piece.
Wheel-piece.

Pilaster. 1. (Architecture.) "A square pier, like a flat column built against a wall, and having cap and base."—*Knight*.

2. (Car construction.) Fig. 654. Any stick or timber fastened against another piece to serve merely as the supporting block or a cross-piece, as *pilaster* (pile-driver car). 5, figs. 1821-4.

Pilaster-pocket (pile-driver car). 16, figs. 1821-4.

Pile-driver car. Figs. 1821-4. A class of cars, one of which at least is kept upon most large railways, built in a great variety of forms as respects the details, but all in substance similar to the engraving shown. The essential features of a pile-driver car are the *swinging-platform*, or *upper-platform*, 27, carrying the cabin and frame-work upon which the *leaders* and *hoisting-engine* and the accompanying gear are carried. The swinging-platform is to enable piles to be driven at a considerable distance from the rails on either side. To enable the cabin to be swung through a wider arc, adjustable *wings* 20 are fixed to the side of the car which are removed when not required for use by the *crane* 34. The leaders are usually long enough to take a 35 to 40 ft. pile and swing upon *leader-trunnions* 15, so that the leaders may be dropped back upon the roof of the cabin for transportation over the road. The *hammers* are usually very heavy. 4,000 to 4,500 lbs.

Pile-hoisting sheave (pile-driver car). 11, fig. 1821-4. A wheel placed at the side of the main sheave for use in hoisting piles. It projects a little further forward than the other, so as to swing the pile more easily clear of the leaders.

Pillar. 1. "A kind of irregular column.

2. "A supporter; that which sustains or upholds; that on which some superstructure rests."—*Webster*. See *Transom-pillar*.

Pillar crane. Fig. 145. A style of crane (largely used on

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passing upward, descends through the *inclosing-cylinder* **B**, in close contact with the chimneys **D**, whence it enters the globe **G**, close to the *globe bezel* **F**, and is heated to a high temperature which is claimed to increase the efficiency of the lamp nearly 80 per cent. The burner is protected by a *wind-guard* **P**, at the top, having perforations to permit the escape of the gases of combustion, and is supported by *lamp-arms* **E**. The supply of gas is controlled by the stop-cock **R**. The *burner-tips* **N** are of somewhat peculiar construction, making a flame more similar to a large candle flame than to an ordinary gas flame, so that a very small perforation in the reflector is sufficient to permit the gases to escape without soiling its surface. The lamps are constructed with one, two, four and five burners, one being most usual in Europe and four in the United States.

Pintsch side-light (for saloons). Figs. 814-15. See above.

The centre and side-lights do not differ in principle.

Pipe. "A tube for conveyance of water, air or other fluids."—*Knight*. The wrought-iron pipes used for conveying gas, steam, etc., and commonly called *gas-pipe*, is usually meant by compound words beginning with pipe, as below.

See *Brake-cylinder pipe*. *Running-pipe*.

Pipe-fittings. Figs. 1837-48, etc. The connections for systems of wrought-iron gas and steam pipes. The more usual pipe-fittings are *bushings, elbows, tees, return-bends* (close or open), *reducers, couplings, nipples, plugs, clips*, etc., which see in Dictionary.

Pipe-reducer. See above. *Bushings, tees* and *couplings* may be and are all so made as to serve as reducers.

Pipe screw-threads. Screw-threads used for connecting wrought-iron pipes together. Such screws are cut "tapered;" that is, the end of the pipe, or the inside of the coupling where the thread is cut, forms part of a cone, so that in screwing up the pipe a tight joint can be made. Pipe-threads are of a V-shape, sharp at the top and bottom, and their sides stand at an angle of 60° to each other. The following is the number of threads per inch for pipes of different sizes. The size is given by the inside diameter, but the actual bore of the smaller sizes is considerably larger than the nominal. The exterior diameter of ordinary gas-pipe is from .27 to .37 in. greater.

AMERICAN STANDARD SYSTEM OF PIPE THREADS.

(The European standard is the *Whitworth* pipe-thread, which is quite different).

Taper of Thread $\frac{3}{4}$ in. per foot.

Size of pipe.	Outside diam. In.	Inside diam. In.	Inside diam. Extra strong. In.	Inside diam. Double extra strong. In.	Threads per inch.	Whitworth's thread.
$\frac{1}{8}$ in.	.405	.27	.205		27	28
$\frac{1}{4}$ "	.54	.364	.264		18	19
$\frac{3}{8}$ "	.675	.494	.421		18	19
$\frac{1}{2}$ "	.84	.623	.512	.244	14	14
$\frac{3}{4}$ "	1.05	.824	.786	.422	14	14
1 "	1.315	1.048	.915	.587	11 $\frac{1}{2}$	11
1 $\frac{1}{4}$ "	1.66	1.38	1.272	.884	11 $\frac{1}{2}$	11
1 $\frac{1}{2}$ "	1.9	1.611	1.494	1.088	11 $\frac{1}{2}$	11
2 "	2.875	2.067	1.953	1.491	11 $\frac{1}{2}$	11
2 $\frac{1}{4}$ "	2.875	2.468	2.315	1.755	8	
3 "	3.5	3.067	2.893	2.284	8	
3 $\frac{1}{2}$ "	4.	3.548	3.358	2.716	8	
4 "	4.5	4.026	3.818	3.136	8	
4 $\frac{1}{2}$ "	5.	4.508			8	
5 "	5.563	5.045			8	
6 "	6.625	6.065			8	
7 "	7.825	7.023			8	
8 "	8.635	7.963			8	
9 "	9.688	9.001			8	
10 "	10.75	10.019			8	

Pipe-stay (Creamer brake, which see). 16, fig. 268.

Pipe-clip, or strap. Figs. 1833, 1845. An iron band for fastening a pipe against or to some other object. They are usually single, but sometimes double, for two or more pipes. See *Clip*.

Pipe-support (Baker heater). Fig. 1832. A cast-iron stand screwed to the floor, with a receptacle at the top to receive and hold a pipe.

Pipe turnbuckle. Fig. 1862. See *Turnbuckle*.

Piston. A metal disk with packing, etc., made to fit air-tight and work back and forth in a cylinder. Those shown in this volume are chiefly in connection with *air* and *steam brakes*, figs. 266-358, to which more detailed reference seems unnecessary. The piston consists of a *piston-head* attached to a *piston-rod*. The *piston follower* or *follower-plate* lies at the back of the piston-head, inclosing between them the *piston packing-rings*, or (in the Westinghouse car brake-cylinders) the *piston packing-leather*, which latter is provided with a *packing-leather expander*. The follower-plate is held on with *follower-bolts*. All these parts are essentially the same in all the various cylinders shown, and for distinctness should be designated with the name of the cylinder within which they work. The *reversing-piston*, which see, of the Westinghouse brake, shifts the main steam-valves which admit steam to the cylinder. See also *Triple-valve piston*, etc., of Westinghouse apparatus.

Piston-packing expander (Westinghouse brake). 9, figs. 329-33; 12, figs. 814-5, etc. See below.

Piston packing-leather (Westinghouse brake). 9, figs. 329-33. A circular ring of leather used as a substitute for *piston packing-rings*, which see, pressed into the cylinder so as to have an L-section, which is attached to and surrounds the piston and bears against the inside surface of the cylinder, being pressed against it by a round steel rod called the *piston packing expander*.

Piston packing-ring. 12-13, fig. 296; 9, fig. 299; 4, figs. 353-9, etc. A circular metal ring of rectangular section which is placed in grooves in the edge of a piston-head to make it work air-tight in its cylinder. The rings are turned slightly larger than the cylinder and cut in two diagonally at one point, so that when compressed they will tend to spring open.

Piston-rod cup-leather (Westinghouse driving-wheel brake). 7, figs. 814-15. A circular ring of leather similar

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single and double metallic plates bolted and riveted together, sidewise, usually intended to work in the teeth of wheels, shaped so as to accurately engage with the chain. Such chains are sometimes used for *berth-chains*.

Pitch-gear (for pile-driver car). 45, fig. 1822. See *Pitch-chain* and *driving-chain*.

Pitching-roof. Figs. 90-6, 134-5, 138. A roof formed of one or more inclined plane surfaces. The term, as also the term "A" car-roof, which see, when the pitch becomes steep, is used to distinguish a roof formed of plane surfaces from one formed of curved or arched surfaces.

Pivot. 1. "A pin or short shaft on which anything turns."—*Webster*. *Seat-arm* pivots are also inaccurately called *rivets*.

See *Deck-sash pivot*.

Lower swing-hanger pivot.

Monitor deck-sash pivot.

Ratchet-pivot.

Rocker-pivot.

Seat-arm pivot.

Upper-berth-rest pivot.

Ventilator-pivot.

Upper swing-hanger pivot.

2. (Of padlock hasp, car-door fastener.) 7, fig. 1109. The pin on which the hasp turns.

3. (For geared car-seat, which see.) Fig. 1142. The

and above the surface secured in ordinary working. The oxidized surface is then reconverted into metallic iron, which will enter readily into combination with an oxidizing agent applied throughout. The surface thus given to the sheet is fixed by planishing or hammering until the desired polish is secured. The recent imitations of Russia iron have been very successful, but nothing yet made out of Russia is quite as good as the original.

Plank. "A broad piece of sawed timber, differing from a board only in being thicker. In America, broad pieces of sawed timber, which are not more than an inch or an inch and a quarter thick are called *boards*; like pieces from an inch and a half to three or four inches thick are called *planks*."—*Webster*.

See *Spring-plank*.

Truss-plank.

Plank car-roof. Fig. 664. More commonly *single-board roof*, which see. See also *Car-roof*.

Planted moulding, or bead moulding (English). 121, figs. 205, 207. American equivalent, *panel-strip moulding, or bead moulding*. In a carriage, a small moulding which is pinned on the body, and is not worked out of the solid on the post or rail, as is a *wrought moulding*, which see.

Plastered-lamp. A lamp with a fixed globe which is fastened to a lamp-frame with plaster of Paris. Fig. 828 is such a lamp.

Plate. 1. A piece of metal flat or extended in breadth.

See *Base-plate*.

Berth-rest plate.

Berth-latch face-plate.

Body-bolster truss-plate.

Bolster-plate.

Bottom stove-plate.

Brake-block suspending-plate.

Buffer-block face plate.

Buffer-plate (Miller).

Centre-plate.

Chafing-plate.

Chair-arm plate.

Corner-plate.

Coupling-pin plate (Miller).

Cover-plate.

Dead-plate.

Deck-sash pivot-plate.

Door-button plate.

Door-hook plate.

Door-sash plate.

Inside top-plate.

Inverted truss-rod plate (street cars).

King-bolt plate.

Letter-box plate.

Match-plate.

Mirror-plate.

Name-plate.

Notice-plate.

Outside top-plate.

Outside wheel-piece plate.

Piston follower-plate.

Pivot-plate.

Reversing valve-plate.

Sash-lock plate.

Seat-arm pivot-plate.

Seat-lock plate.

Sliding-door-latch plate.

Slanting table-leg plate.

Stop-plate.

Drawbar chafing-plate (Miller).

Drawbar face-plate.

Drawbar follower-plate.

Drawbar friction-plate (street cars).

Draw-hook plate.

Drop letter-box plate.

Face-plate.

Flag-holder plate.

Follower-plate.

Friction-plate.

Frieze ventilator-plate.

Hopper-plate.

Inscription-plate.

Strike-plate.

Suspending-plate.

Table-hook plate.

Table-leg-hook plate.

Threshold-plate.

Transom chafing-plate.

Truck-bolster chafing-plate.

Uncoupling-lever plate.

Uncoupling-lever trunnion-plate.

Upper berth-rest plate.

Ventilator pivot plate.

Wheel-piece plate.

Winding-shaft plate.

2. (Architecture.) "A piece of timber which supports the ends of the rafters."—*Webster*.

8. (Car-building.) 46, figs. 82-102; 98, figs. 155-85; 47, figs. 1848-4. A horizontal piece of timber on top of the posts of a car-body supporting the roof carlines or rafters. Also sometimes called *side-plate* in distinction from an *end-plate*, which see, which is a similar stick across the end of the car. A *deck-plate* is used to cap the deck-posts of an upper-deck. Main carlines, which see, are sometimes called *tie-plates*. In refrigerator cars *bogie-plates*, which see, are used.

4. (Of a cast car-wheel.) Figs. 2124-78. The central portion connecting the hub and tread, sometimes *single-plate*, sometimes *double-plate*. The plate is stiffened by brackets. See *Car-wheel* and *face-plate* (steel-tired wheel). Plate, or laminated, buffing and draw-spring (English). 51, figs. 117 and 206. A large *half-elliptic* spring which spans the distance between the two *buffer-rods* and takes the buffing strains. It is also connected in the centre to the *drawbar* and takes the draft strain.

Plate-bolt strip (freight cars). 189, figs. 94-5. A longitudinal strip attached to the under side of the purlins to stiffen the roof and serve as a point of attachment for the horizontal *short plate-rod*, 192.

Plate-rod (freight cars). 47, figs. 132-8. A horizontal metal rod which passes through two plates to tie them together. See also *Short plate-rods*, 192, figs. 93-6.

Plate-washer. Fig. 1873. Usually a wrought-iron cut washer, in distinction from a *cast washer*, but also used to designate many forms of large washers or plates serving as double or triple washers. See *Washer*.

Plate-wheel. Figs. 2124-78. A car-wheel of which the centre portion is formed of a disk or plate instead of

pen and com-
wheel.

686; 34, figs.
supported by
facilitate in-
not common,
are sometimes
also *Miller*,
ertain special
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see *Swinging-*

d 36. A *flat*
has a *gondola*

, figs. 155-85;
ater end of a

1843-4.
used to close
only for pri-

1845. A small wooden moulding to cover the nails with which the roofing canvas is fastened around the edge. It corresponds with a roof-moulding.

Platform-hood post. 109, figs. 162-185. An upright iron bar or rod attached either to the platform or platform railing, to support a platform-hood. Now rarely used.

Platform-hood side-piece. 10, fig. 186. The end-piece to which the ceiling is attached.

Platform-lever (Janney coupler). 24, figs. 552, 555-601. (Janney-Miller coupler.) 69, figs. 554, 602-35. A lever corresponding to the *Miller uncoupling-lever*, actuating the *pull-rod* which operates the *catch-lever*.

Platform-lever jaw (Janney-Miller coupler). 58, figs. 554, 602-35. The fulcrum for the platform-lever.

Platform-lever pin (Janney coupler). 20, figs. 554, 555-601.

Platform-plate, or buffer (Cowell coupler). 1, fig. 538. A steel plate bent like the letter U, but with square angles, clasping the middle of the platform end-sill of the car. When in contact with the like plate of another car, it makes a continuous floor between them, 17 inches wide. Being pivoted at the platform end-sill, it adjusts itself to all curves of the road. The platform plate also acts as a

roof which projects over the platform. See *Platform-hood*.

Platform-roof carline. 104, figs. 155-85. See *Carline*.

Platform-roof end-carline. 105, figs. 155-85. See *Carline*.

Platform short-sills. 37, figs. 155-85. Short longitudinal pieces of timber, *not* extending under the car proper, which are framed into and bolted to the end-sills and platform end-timbers of a passenger or street car to sustain the floor of the platform. The longer timbers which extend under the body of the car proper are called *platform-sills*.

Platform-silla. 35, figs. 151-185; 101, figs. 1844-6. Pieces of timber attached to the bottom of a car-frame at each end outside of the draw-timber, and projecting beyond the end of the car to support the platform. They extend usually from the platform end-timbers to the bolster, or, in street cars, to one of the transverse floor-timbers. See above.

Platform-steps. 45, figs. 153-85; 114, figs. 1843-6. The stairs at each corner of a passenger car which afford the means of ingress and egress. A form of step has been recently introduced, but is not in general use, in which the lower step is *extensible*, being dropped down into position when the car is stationary and removed and elevated again by the motion of the train in getting under way. In modern passenger cars the platform-steps consist of usually three and sometimes four separate steps below the platform. The steps being of wood are often called *box-steps*. On street cars, one step only is used, and it is commonly made of plate-iron.

Platform tie-rods. 162, figs. 170-185; 51, figs. 636-40. Horizontal rods which pass through the *platform end-timber* and end-sill or body-bolster, for the purpose of holding them and the other portions of the frame of the car securely together.

Platform-timber. See *Platform-sill*.

Platform-timber band (street cars). 105, figs. 1843-6. A band made of plate-iron, which covers and embraces the outer end of a platform end-timber.

Platform-timber, or platform-sill, clamp. 36, figs. 156-85; 102, figs. 1843-6. A U-shaped iron clamp or bolt, with which a platform-sill is fastened to the end-sill of a car.

Platform trap-door. 1. 3, fig. 686. A door which

covers the space occupied by the steps, and thus extends the platform out to the side of the car. It is rarely used, except on officers' or other private cars.

2. Fig. 103. A door used in cabooses to serve the purpose of a water-closet.

3 (Janney-Miller coupler). 68, figs. 602-35. See *Trap*.

Platform truss-beam (Miller platform). 22, figs. 636-8.

A short transverse piece of timber attached to the outer ends of the draw-timbers inside the platform end-timber, which forms the bearing of the *platform truss-rods*.

Platform truss-rod (Miller platform). 23, figs. 636-40.

A rod fastened at one end to the body-bolster or centre-sills, which then passes through or over the end-sill and from there downward to the platform truss-beam. Its use is to support the platform and prevent it from sagging.

Play. See *End-play*. *Lateral motion*.

Plow. See *Snow-plow*.

Plug (pipe-fittings). Fig. 1339. A short solid metal cylinder, with a screw on the outside and a square or hexagonal end to take hold of with a wrench, screwed into the end of a pipe or hole in a plate, to close the opening. See also *Basin plug*. *Four-way-cock plug*.

Plumbago. Graphite; one of the forms of pure carbon, from which pencils, etc., are manufactured. When pulverized, plumbago is an excellent lubricant, especially under heavy loads, and *plumbago oils*, prepared so as to hold the plumbago in permanent suspension, are among the most efficient of all lubricants.

Plush. "A species of shaggy cloth or stuff with a velvet nap on one side, composed regularly of a woof, of a single thread and a double warp; the one, wool of two threads twisted, the other of goat's or camel's hair. But some plushes are made wholly of worsted, others wholly of hair."—*Webster*. Plush is used in car-building chiefly as a covering for upholstered seats, for which it is almost invariably used.

Pocket. 1. (Sleeping cars.) 32, 33, figs. 678, etc. A receptacle for the clothing and small baggage of occupants of sleeping-berths. They are known as the *head board pocket* for the lower berth, and *upper-berth pocket*.

2. Any object having a cavity or opening which forms a receptacle to hold anything in its place. The main pockets of a car are the *body-post*, *corner-post* and

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of a flat or gon-
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spring pocket.

g so as to open
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72.

valve for the

river car). 26,
al set upright
, as the *posts*
of a gate; the

Postal cars are built and owned by the railway com-
panies, but when in use are under the exclusive control
of the post-office authorities. See also *Mail-van* (Eng-
lish).

Postal-car chandelier. Figs. 840-2. See *Chandelier*. A
variety of postal-car lamps and chandeliers have been in-
troduced with the object of giving a brilliant light when
and as desired.

Postal-car furnishings. Figs. 1065, 1086.

Postal-car lamp-chimneys. Figs. 935-6. See *Lamp-
chimneys*.

Postal-car side-lamp. Figs. 856, 862-3, 871. See *Postal-
car chandelier*.

Post-bracket (Creamer brake, which see). 3, fig. 263.

Post-office car. Figs. 57, 66-9. See *Postal car*.

Post-pocket. An iron casting which is attached to the
outside of the sill of a car to receive and hold a post in
distinction from the *body-post pockets*, *corner-post pock-
ets*, etc., of ordinary framing. Such pockets are more
commonly used with stock cars and are very similar to
stake-pockets. Shown on the side of the car in figs.
16-18, 29-32, 35-8. See *Pocket*.

Post refrigerator car. One of the class of cars using salt
and ice for refrigeration. See *Refrigerator car*.

gauge usually placed in the saloon. It registers atmospheres and not pounds, for convenience in computing the volume of gas in the tank.

Pressure-regulator (Pint-ch gas-lighting apparatus). J, fig. 812, and fig. 813. The valve by which the pressure of the compressed gas is reduced for consumption. The pressure regulator is one complete fixture, adjusted by the maker. Names of the principal interior parts are *diaphragm*, *diaphragm connecting-rod*, *diaphragm-lever*, *regulating-valve*, and *dust-arrester*.

Pressure-retaining valve (Westinghouse brake). Fig. 817. *Pressure-valve key*. *Pressure-valve seat*.

Pressure-retaining valve (Westinghouse freight brake). Fig. 817. A valve for use on long and steep gradients, provided with a weighted valve connected with the discharge port of the triple valve. It is controlled by a small handle, which, if turned in one direction, permits the air to escape freely, and, if in the other, forces it to pass under the weighted valve. In descending long gradients the weighted valve retains a pressure of ten lbs., which keeps the train under control when the brakes are released to recharge the reservoirs. On slight grades or a level the cock is turned to permit the air to escape freely without raising the valve. This valve does away with the necessity of using "straight-air" (which see) on such grades.

Pressure tank (Johnson heater). Fig. 1473. The receptacle in which the spare supply of fluid is kept, connected with the heater by a heater-pipe. The same part is called in the Baker heater the *circulating drum*, and in the Searle the *expansion drum*.

Profile carline. Figs. 646, etc. A carline, which see, extending from one plate to the other, bent to conform to the shape of the clear-story. They are, of necessity, always *compound-carlines*, which see, shown in section in fig. 617.

Priming (painting). The first coat in car-painting. Usually a pure thin oil put on hot, at about 150° F. or less. A *thin drier*, which see, of red lead or borate of manganese, is used with it. The next coat is the scraping filling-coat or *rough-stuff*, which see. See also *Painting*.

Private car. Figs. 211-3. Either an *officers' car* or *excursion car*, which see.

Private lock (English). 182, fig. 205. A door-lock universal in passenger service, which can only be operated

by a tapered rectangular hardened steel key, which is carried by all passenger trainmen, and most habitual travelers. One key will open any "private lock."

Propelling-lever, or hand-car lever (lever hand-car). 3, figs. 1724-6. The main lever to which power is applied.

Propelling-lever brace-rods (lever hand-car). 11, figs. 1724-3.

Propelling-lever fulcrum (lever hand-car). 6, figs. 1724-6.

Protection-cap (of wind-guard Harrison postal-car chandelier). B, figs. 841-2. This part complete is called also *lamp-jack*, 136, fig. 158.

"Protection" cuspidor. Figs. 810-11. One with a large mat. See *Cuspidor*.

Pull. "A catch or lip upon a drawer, door or window, by which it is pulled open."—*Knight*.

See *Door-pull*.

Seat-pull.

Drawer-pull.

Sliding-door pull.

Deck-sash pull.

Window-blind pull.

See, in engravings, *Furnishings*, *door*, *postal car* and *window*.

Pulley. "A wheel with a grooved, flat or slightly convex rim, adapted to receive a cord or band which runs over it. Its function is to transmit power or change the direction of motion."—*Knight*. A *sheave* is a pulley-wheel in a block, but *sheave* and *pulley* are used as almost synonymous terms. See *Sheave*.

See also *Bell-cord pulley*.

Pile hoisting sheave.

Berth-chain pulley.

Side-pulley.

Cabin-pulley.

Window-curtain pulley.

Hammer-rope pulley.

Pull-hook, or deck-sash opener. Fig. 1536. A shaft with a small hook on the top for opening deck-sashes. Also called *ventilator staff*.

Pull-iron. 206, figs. 95-7. A U-bolt passing through the side-sill for the purpose of attaching ropes in switching. A *push-block*, 191, fig. 97; 58, figs. 1:2-3, is an attachment to the lower corner-plate for the same purpose except that it is used for pushing instead of pulling the car.

Pullman car. Figs. 60-1, etc. A name strictly applicable only to cars run by the Pullman Palace Car Company, but in common usage not infrequently applied to all classes of "palace" sleeping, parlor or drawing-room cars, as distinguished from day coaches; the Pullman cars having been the first of this class introduced on a

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55-601. The

applied, which insures the release of the brakes, without delay. It also obviates the unnecessary working of the pump, when the desired air-pressure has been obtained.

The list of names of parts for fig. 316 is wrongly headed "Fig. 312."

Pump regulator (Westinghouse brake). 17, figs. 311, 312.

The old design for the *pump governor*, which see.

Punch. See *Bell-punch*.

Purlin. 83, figs. 91-138; 205, figs. 97-101. A longitudinal piece of timber over the rafters, extending from one end of a car-roof to the other, to which the roof-boards are fastened. Sometimes called a *roof-strip*, but the latter more correctly applies to strips sometimes used above the purlins, as in figs. 670-5, etc.

Push baggage-car. Fig. 1713. A light *lorry-car* used at stations for moving baggage or freight from one train to another.

Push-bar. 1. ("American" steam driver-brake) 16, figs. 353-9; 23, figs. 363-4. The part in immediate connection with the brake-shoe by which the pressure is conveyed thereto.

2. (Westinghouse brake.) Figs. 343, etc. Also called

moved or pushed by hand. Also see *Ferry push-car*, fig. 72.

Push-rod (Westinghouse freight brake). Figs. 343, etc. See *Push-bar*.

Push-rod (Westinghouse freight brake-gear). 3, figs. 358-9; 343. The rod which butts against the brake-cylinder piston-rod and transmits its thrust. Generally, in brake-gear, any rod which transmits a thrust when the brake is applied.

Push-rod hanger (Westinghouse freight-brake). 1, figs. 338-40. A guide attached to the sills of the car to carry the outer extremity of the *push-rod*.

Putty. A mixture of linseed oil with whiting, which latter is chalk finely pulverized. Water is sometimes added in adulteration, causing the putty to stick to the fingers, and making it hard and brittle when dry. *Panel putty*, used for filling nail-holes in car work, is an extra quality made from whiting, white lead in oil, japan or varnish, and a small quantity of turpentine. The whiting is used merely to prevent the white lead from sticking to the fingers, and no more than necessary for this purpose is required. This putty forms a hard cement which does not shrink. When dry it can be rubbed down with pumice-stone or dusted with sand-paper. *Glycerine putty* is made of good thick glycerine and white lead or litharge. It hardens in 15 to 45 minutes, and stands water and acids.

Q

Quadrant. A piece of metal curved in the form of the arc of a circle. See *Sector*. See also *Deck-sash quadrant*, fig. 1633. *Lever-quadrant* (Eames ejector). figs. 262-3.

Quadruple-coil nest-spring. Fig. 2062. A rarely used *spiral spring*, which see.

Quadruplet (of elliptic springs, which see). 80, figs. 1963-9, etc. Four springs side by side acting as one.

Quarter-light, or side-light (English). 137, figs. 204, 206. American equivalent, *window*. In a carriage, the window in the body as distinguished from the windows in the doors. The quarter-lights, in English practice, are always fixed, but on the continent of Europe they are invariably made to fall or open, and this is also the case

with the vehicles made in England and exported to warm climates.

Quarter-light moulding, or glass-frame stile (English). 142, fig. 205. The upright member of the fixed window framing. The glass is very generally fitted direct to the body, a strip of rubber being interposed, and the moulding screwed on outside, keeping the whole in position.

Quarter-light panel (English). 126, fig. 205. A panel on the outside of the body, placed above the window. Other exterior panels are *quarter-panel*, *waist-panel*, and *bottom side-panel*. Interior panels are the *partition panel*, *inside top-light panel* and *roof panels*.

Quarter-light pillar (English). 110, figs. 205-206. A part of the body framing of a carriage. A vertical post forming one side of the window aperture.

Quartette (elliptic spring). Also called *quadruplets*, which see.

Queen Anne style. Primarily a style of construction of furniture and buildings which became fashionable in England during Queen Anne's reign, in the early part of the 18th century. Its features are light and graceful framing, involving mostly straight lines, and an absence of applied ornament. Deep, rich tints are used in coloring. For examples of modern applications, see figs. 679, 827, 1194, etc.

Queen-post (of a truss). 6, fig. 2183. One of a pair of vertical posts against which the *truss-rod* bears. When one post only is used, it is called a *king-post*, which see. Such posts are used for the *body truss-rods* under car-bodies and occasionally trucks. See *Body queen-post*. *Inverted body queen-post*. *Truck-frame queen post*.

Queen-post stay. A, fig. 163. A bar attached to a queen-post to stay it laterally. See *Body queen-post stay*.

Quintuplet (of elliptic springs, which see). Five springs side by side, acting as one. Similar to 80, figs. 1963-5, or fig. 2083-4.

R

Rabbet. "A rectangular groove made longitudinally along the edge of one piece to receive the edge of another. It is common in paneling, and in door-frames for the door to shut into."—*Knight*. *Rabbet* is a corruption of the word *rebate*.

Rabbeted lock. Fig. 994. "A kind of lock whose face-

ge of a door."

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and excitable
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1142.

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ntire forming

See *Belt-rail.*

Bottom-rail.

Deck Bottom-rail.

*Door case interme-
diate rail.*

Door-case top-rail.

Door-rail.

End-rail.

Fender-rail.

Top end-rail.

Top side-rail.

Upper belt-rail.

Guide-rail.

Hand-rail.

Lower seat-back rail.

Middle door-rail.

Panel-rail.

Parting-rail.

Platform-rail.

Sash-rail.

Seat-back rail.

Seat-bottom rail.

Seat-rail.

Wainscot-rail.

Window-blind rail.

Railing. "A series of rails; a fence."—Webster. See *Platform-railing.* *Step railing* (street cars).

Railing-chain. 42, fig. 157. See *Platform railing-chain.*

Railroad car. See *Car.*

Railroad-lantern. Figs. 980-85. A lantern used in large numbers by trainmen and other employes of railroads. A variety of patterns exist, and are shown. A *conductor's lantern*, which see, is a special variety, but not so called.

Raised-roof. Figs. 155-85. An upper-deck or *clear-story*, which see.

Ranges and cock-stoves. Figs. 1430-3, also figs. 214, 193 etc. A *range* is a fixed and more elaborate cook-

of ratchets and attached parts used in connection therewith.

In most of the English dictionaries the term *ratchet* is defined not only as the serrated edge, but also as the dog or pawl which engages therewith. This definition, however, is believed to be an error, which has been copied from one dictionary to another, and which does not correspond with practice in mechanical work, at least as respects American practice, which latter seems to confine the use of the term *ratchet* to the serrated edge only and does not designate the pawl also as a ratchet.

Ratchet-burner (for kerosene oil). Fig. 918. One in which the wick is moved up and down by a pointed wheel engaging in it, like mineral oil burners.

Ratchet-wheel. See *Brake ratchet-wheel*. *Winding-shaft ratchet-wheel*.

Rattan car-seat. Fig. 1189½. See *Car-seat*.

Rattan-seating (canvas lined). Fig. 1218. See *Canvas-lined*.

Rave. Fig. 1708, 1718. 15, figs. 1720-3. A vertical side-piece to the frame of a wagon-body or other vehicle. The term is applied to such parts on hand-cars (the raves being also called *seat-risers*), but not to other railroad cars, although literally applicable, for instance, to the sides of a gondola car.

Reach. Figs. 1780-1812. See *Extension-reach*.

Rear foot-rest (Hartley reclining-chair). Figs. 157-8. A foot-rest for the benefit of the occupant of the chair in the rear. See *Foot-rest*.

Rebate. "In architecture, a groove or channel sunk on the edge of a piece of timber."—*Webster*. Usually written *rabbet*, which see.

Receiving-valves (*upper and lower*), (air-pump for Westinghouse brake). 31 and 33, figs. 298-9. Puppet valves, which see, at the top and bottom of the air-pump cylinder, to admit the air.

Recipient (Pintsch gas-lighting apparatus). H, fig. 812. Two large tanks, one under each side of the car, in which the compressed gas is stored and discharged thence into the *pressure-regulator*. See below.

Recipient filling-valve (Pintsch gas-lighting apparatus). A, fig. 812, and separately in figs. 813-19. A valve of peculiar construction for the admission of the compressed gas to the recipient, so that it can be transmitted through the same valve to the regulator for consumption.

Recipient valve (Pintsch gas-lighting apparatus). B, fig. 813; fig. 817. The cock attached to the recipient to connect it with the filling-valve or the regulator, as desired.

Recording-bell (street cars). A bell attached to a bell-punch or other instrument on which the conductor records the fares collected, to indicate that fact to the passengers.

Reducer (pipe fittings, which see). Figs. 1344, etc. A means of decreasing the diameter of the pipe used. They are either *bushings*, *couplings* or *T's*, which see.

Reducing collar (for lamp-). Fig. 909. See *Collar*.

Reducing pipe-coupling. Figs. 1344, etc. See *Reducer*.

Reducing tee or T (pipe fittings, which see). Fig. 1333. See also *Reducer* and *T*.

Reducing-valve (Westinghouse train signal apparatus). Fig. 691. A valve for reducing the pressure of air admitted to the train signal pipes below that maintained in the brake pipes and main reservoir. In the train signal apparatus a very low pressure, not usually exceeding two atmospheres, is used.

Reflector. 1. (Lamps.) 14, figs. 828-33. "A polished surface for reflecting light."—*Webster*. See also *Alcove-lamp Reflector*, 25, figs. 855, 864. *Lamp-chimney Reflector*, 15, figs. 848, 857.

2. (Lanterns.) Figs. 983-4. *Reflector and chimney-holder combined* (for lamp), figs. 866, 983.

Refrigerator (of a refrigerator car). A, figs. 181, etc. The chamber, constituting the main body of the car, in which the paying load is placed.

Refrigerator car. Figs. 11-12, 126-131½. A car for carrying perishable articles, especially meat, constructed with compartments in which ice is carried, and with double floor, sides and roof, to keep the ice from melting. A great variety of types have been designed, but they can all be reduced to four general classes, viz.: Those which use ice and salt, or ice only, for refrigerating, and those which carry ice overhead in *ice-pans* or in the ends of the cars in *ice-racks* or *tubes*. The most important difference of all in refrigerator cars, the difference in the character of the circulation and dryness of air, is not touched by this classification, nor can it be gone into. The temperature aimed at is about 40° F., or 8° above freezing. Many of the older cars were ----- air-tight boxes, without any circulation

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in the external
seen in fig. 12,
refrigerator-cars
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the roof.

boxes at each end
generating.
umber for the cir-

Regulating-nut, spring, etc. (Westinghouse pump gov-
ernor). 15, fig. 316.

Regulating-valve (Pintsch gas pressure-regulator). Fig.
813. See *Pressure-regulator*.

Regulator. See *Heat and draft regulator*, figs. 1491-2.
Pressure-regulator, figs. 812-3.

Release-bracket (Am'n aut. compression brake, which see).
21, figs 368-9. A bracket fixed to the timbers of the car
to which one end of the *release-chain* is attached by the
release-nut and *eye-bolt*.

Release-chain. 18, figs. 368-9. See above.

Release-chain eye-bolt. 19, figs 368-9. See above.

Release-cock (Westinghouse brake). Fig. 326; 24, fig.
311. Also popularly called *bleeding-valve*. A cock at-
tached to the brake-cylinders for permitting the com-
pressed air to escape therefrom, when the locomotive is
detached or when the apparatus is out of order, so as to
release or "bleed" the brakes.

Release-lever (Westinghouse brake). A bent lever, now
no longer used, to which an exterior *release-spring*,
which see, was attached for drawing the brake-beams
away from the wheels when the air pressure was re-leased.
The release-spring is now placed within the cylinder, as
in figs. 3-9-31.

a separate triple-valve and auxiliary reservoir placed on the engine. In the Westinghouse freight-brake, figs. 838-9, etc., the auxiliary reservoir is constructed in one piece with the triple-valve and brake-cylinder.

2. Or *Lamp-body* (Moebring argand lamp). A, figs. 649-50. See also *Lamp-reservoir*, or *lamp-fount*.

3. (Pintsch gas-lighting apparatus.) More properly, recipient. H, fig. 812, which see.

4. (Student lamp.) A (or G), figs. 852-4. The removable cylinder carried within the shell called the *outside cylinder*.

Reservoir drain-cock (Westinghouse brake). 24, fig. 811; fig. 826. A cock for emptying the reservoir of any water condensed from the air. Formerly also used as a *release-cock*, or *cylinder release-cock*, which see, for letting off or "bleeding" the brake.

Reservoir drip-chamber (student lamp). C, fig. 852-854. A cavity in the outside cylinder below the reservoir. Used only in the best lamps.

Reservoir journal-box. Fig. 2010. See *Top-reservoir journal-box*.

Reservoir pipe (for Westinghouse brake). Also called *discharge pipe*. 9, figs. 295-7. The pipe conveying the air from the air-pump to the reservoir.

Rest. That which supports something or on which it rests.

See *Arm-rest*.

Berth-rest.

Foot-rest.

Grate-rest.

Side foot-rest.

Side-rest (tip car).

Stake-rest.

Upper berth-rest.

Window-blind rest.

Window-sash rest (street cars).

Restaurant car. Figs. 56, etc. More properly *dining car*, which see.

Retaining-lip (Atwood hemp-parked wheel, which see). Figs. 2166-8. A ring very similar in principle to a *retaining-ring*, which see, turned upon the inside of the *wheel-centre flange*.

Retaining-ring (for wheel tires). Figs. 2156, 2157, 2158, 2162-65, 2166-68, 2177-78. A ring securing the tire to the wheel. See *Mansell retaining-ring*, and *tire-fastening*.

Return-bend (pipe-fittings). Figs. 1387-41. A short cast-iron U-shaped tube for uniting the ends of two wrought-iron pipes. They are called *close return-bends*, or *open return-bends*, according as the section of the pipe is kept a distinct circle at all points. The close return-bend has

simply a partition dividing the two parts for a short distance.

Return-tag. Fig. 1114. A tag attached to cars, usually by slipping it on to the shackle of the seal, and used as an evidence of the due arrival of the car or as a direction to what point the car itself is to be returned.

Reversible car-seat. Fig. 1189. A name sometimes applied to the common form of car-seat in which the back only reverses, but more properly applied to such a seat as the *Buntin reversible car-seat*, which see, in which the seat is moved and not the seat-back only, what was the seat becoming the seat-back, and *vice versa*.

Reversible lantern. Figs. 972-3. See *Burrell's reversible signal lantern*.

Reversible street car. Fig. 1842. A street car with a running-gear on which the body can be turned, or reversed, at the end of its route. Little used. See *Street-car*.

Reversing-cylinder (engine for Westinghouse brake). 22, fig. 298; 19, fig. 299. A small hollow metal cylinder in the steam cylinder-head in which the *reversing piston*, which see, works.

Reversing-cylinder cap (engine for Westinghouse brake). 21, fig. 299, etc. A metal screw-plug screwed into the recess which receives the reversing-cylinder and holds the latter in its place.

Reversing-piston (engine for Westinghouse brake). 23, fig. 298; 20, fig. 299. A small piston placed above the steam-valves and which moves the latter downward. The excess of steam-pressure on the under side of the upper steam-valve, owing to its being larger than the lower one, moves them upward when the pressure on the reversing-piston is released by the movement of the *reversing-valve*, at the top of the stroke of the main steam piston, which then strikes the *reversing-valve stem*, which see.

Reversing-piston packing-ring (Westinghouse brake). 9, fig. 298; 16, fig. 299. See *Piston*.

Reversing-valve (engine of Westinghouse brake). 16, fig. 298. A slide-valve working in a small cylinder in the steam-cylinder head, and thus controlling the admission and exhaust of steam to and from the *reversing-piston*. See *Reversing-valve stem*.

Reversing-valve bush, or *bushing* (engine of Westinghouse brake). 19, fig. 298; 23, fig. 299. See *Bushing*.

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ghouse brake).

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rlor-car chair.

ar chandelier,

See *Wheel-rib*.

2. See *Lamp*.

Right and left of a seat is as for a person sitting in a seat; *of a stove or of the end of a car* is as for a person facing it; *of a brace* is one which leans to the right or left of a person standing facing the side of the car.

Right and left screw. A pair of screw-threads cut turning in opposite directions, so that a common nut or pipe-coupling tapped with similar threads will, according to the direction in which it is turned, draw the two rods nearer together or press them farther apart.

Right-and-left-screw turnbuckle. Fig. 1882. See *Turnbuckle*. Other forms are *swivel turnbuckle*, fig. 1881, and *tube turnbuckle*, fig. 1881.

Right-hand brace-pocket. 40, figs. 132-6. See *Right and left*.

Right-hand seat (of car-seats with a stationary back). Figs. 1134-5, etc. See *Right and left*.

Right-hand seat-end. See above.

Rigid-bolster truck. Figs. 1907-11, etc. A car-truck with a bolster which has no lateral or *swing motion*, which see. See also *Bolster* and *truck-bolster*.

Rigid caster (for tables). Fig. 1545. See *Caster*. A "rigid caster" is a mere socket and not properly a caster at all, except from being used in the same manner as a

iron ring attached to the *smoke-top* to stiffen it, and hold the feed-door.

Riser. See *Step-riser*. *Seat-riser*.

Rivet. "A pin of iron or other metal with a head drawn through a piece of timber or metal, and the point bent or spread and beat down fast to prevent it being drawn out, or a pin or bolt clinched at both ends."—*Webster*. See *Coupling-link rivet*. The *seat-arm pivot*, which see, figs. 1167, e.c., is usually in the trade termed a rivet, but incorrectly.

Rivet-fastening (English). Fig. 2152. As applied to railroad wheels, the oldest and most defective mode of securing the tire to the wheel. It is fast becoming obsolete and is only used on the cheapest kind of coal cars. See *Tire-fastening*.

Rivet-seal. Figs. 1117-9. A seal with a lead rivet which is closed by a die. See *Car-seal*.

Rocker. 1. (Geared car-seat, which see.) Fig. 1142. The end-piece rocking on a central pivot and moved by the *rocker-arm* in such manner that the reversing of the back changes the inclination of the seat. See also *Mason rocker car-seat*, figs. 1133-8, which accomplishes the same end differently.

2. (Tip-car). 155, fig. 143. A crescent-shaped casting bolted to the *rocker-timbers* of the car-body on which the body rests, and rolls when the body is tipped.

Rocker-bearing (tip-car). 156, fig. 143. The iron cap for the *rocker-bearing timber* to support the rocker.

Rocker-bearing timber (tip-car). 157, fig. 143. A horizontal timber at the end of the car on which the *rocker-bearing* rests.

Rocker-bearing-timber hangers (tip-car). 158, fig. 143. Vertical timbers or iron bars framed and bolted to the *end-piece*, to which the *rocker-bearing timbers* are fastened.

Rocker car-seat. Figs. 1123-29. A seat having the bottom adjustable so as to give it an inclination towards the seat-back in all cases, on whichever side the seat-back may be placed. See *Rocker* and *car-seat*.

Rocker side-bearing. Fig. 2030. See *Side-bearing*.

Rocker-timbers (tip-car). 159, fig. 143. See *Rocker*.

Rocking-bar (grate of Baker heater). 16, fig. 1801; fig. 1817. A horizontal bar which supports the grate, and on which the latter is attached by a pivot in the centre

so that it can be turned horizontally and thus shake the fire. A vertical movement is often used instead.

Rock-lever (Cowell platform and coupler). 2, fig. 533. An equalizing-bar, with a knuckle-joint in the middle of of the rear, which rests on the end of the *slide-pin* 3, and allows free horizontal motion to its two arms. Upon the ends of the latter in front rest the rear ends of the *buffer-springs* 14. The object of the rock-lever is to equalize the pressure of the springs on the inside of the *platform-plate* (1) when passing curves.

Rock-plank. A *truss-plank*, which see.

Rock-shaft arm (Hartley chair, which see). 8, figs. 1154-8.

Rod. In car-building this term generally means a slender bar of iron with a nut on each end, in distinction from a bolt which has a head on one end and a nut on the other. Very long bolts, however, are often called rods. Rods in general take their name from the parts with which they are connected or the use which they serve. Among the rods used in car framing are:

<i>Body-bolster truss-rod.</i>	<i>Draw-rod.</i>
<i>Body brace-rod (centre and end).</i>	<i>End-girth tie-rod.</i>
<i>Body counterbrace-rod.</i>	<i>Girth tie-rod.</i>
<i>Body truss-rod.</i>	<i>Inverted body-truss-rod.</i>
<i>Brace straining-rod.</i>	<i>Plate-rod.</i>
<i>Centre draw-rod.</i>	<i>Platform tie-rod.</i>
<i>Cross-frame, or needle-beam truss-rod.</i>	<i>Platform truss-rod.</i>
	<i>Sill-and-plate rod.</i>
	<i>Sill tie-rod.</i>

Among the rods connected with brake-gear are:

<i>Brake beam truss-rod.</i>	<i>Floating connecting-rod.</i>
<i>Brake-block tie-rod.</i>	<i>Long brake-rod.</i>
<i>Brake-shaft connecting-rod.</i>	<i>Lower brake rod.</i>
<i>Cylinder-lever tie-rod.</i>	<i>Release-lever rod.</i>
	<i>Secondary brake-rod.</i>

Among the rods in trucks are:

<i>Pedestal stay-rod.</i>	<i>Truck-bolster truss-rod.</i>
<i>Safety-beam tie-rod.</i>	<i>Wheel-piece tie-rod.</i>
<i>Safety-beam truss-rod.</i>	<i>Wheel-piece truss-rod.</i>
<i>Transom truss-rod.</i>	

Among rods for interior fittings of cars are:

<i>Basket-rack rod.</i>	<i>Window-curtain rod.</i>
<i>Berth-curtain rod.</i>	<i>Window-shade rod.</i>
<i>Grain-door rod.</i>	

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See *Bell-cord*

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See *Axle. Car-*

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Roof-boards. 1. 86, figs. 88-92, 132-8; 102, figs. 155-85; 55, figs. 1843-4. The boards which form a covering of a roof. They run longitudinally on passenger cars and usually transversely on freight cars. See *Car-roof*.

2. (English.) 131, figs. 204-5. The planking forming the roof. It invariably runs longitudinally.

Roof-brace. 1. (Freight car-roofs) 85, figs. 133, 137. Diagonal strips of wood or iron attached to the top of the rafters or carlines under the roof-covering to stiffen the roof.

2. (Of a centre lamp or chandelier). 32, figs. 827 $\frac{1}{2}$ -71. Diagonal stays passing from the lamp to the roof. Vertical supporting stays are known as *lamp-arms*, with or without a large *centre-stay*.

Roof-brace hub (Harrison postal-car chandelier). G, figs. 841-2. A hub on the centre-stay to which the roof-braces are attached.

Roof commode-handle (English). 176, figs. 205-7. See *Ascending rail*.

Roof corner-casting (passenger cars). A cast-iron moulding for the corners of platform-roofs. They are made rights and lefts, and are specified as for a person standing and facing the end of the car.

head linings, manufactured in any width up to 12 ft. It is lighter than roofing canvas.

Roof-lamp (English). 160 to 168, figs. 204, 205. A lamp used to illuminate the inside of a carriage or other covered vehicle. A circular hole, about 8 in. diameter, is cut through the roof, and the roof lamp placed in this aperture from the outside, the glass and burner when in position being a little below the inner surface of the roof, and entirely inaccessible from within. This form of lamp is wasteful of oil, yields a dim and uncertain light, is costly to handle and the glass is constantly broken. It is therefore being superseded in Germany and England by Pintsch's and similar methods of using compressed oil-gas.

See <i>Lamp-case.</i>	<i>Lamp-burner.</i>
<i>Lamp-cover.</i>	<i>Lamp-glass.</i>
<i>Lamp-plug.</i>	<i>Lamp-case base.</i>
<i>Lamp plug stand.</i>	<i>Inner lamp-ring.</i>
<i>Lamp-cover spring-catch.</i>	

Roof-lever (Creamer brake, which see). 9, fig. 265.

Roof-light. A *deck-sash*, which see. See also *End roof-light* (street cars).

Roof-panel (end). 11, fig. 186. The panel over the door of passenger cars.

Roof-piece (Gouge heater). 103, figs. 1421, etc. A sheet-iron plate fitted to the roof through which the *injector* and *smoke-pipe* pass.

Roof-ridge (freight cars). The intersection of the two plane surfaces forming a pitching-roof.

Roof running-board. 87, figs. 82-183. See *Running-board*.

Roof running-board bracket. 89, figs. 87-96. See *Running-board bracket*.

Roof running-board extension. 83, figs. 87-91. See *Running-board extension*.

Roof-sheets. 1, fig. 669; 2, fig. 665; E, figs. 667-8. Metallic sheets, sometimes corrugated and sometimes not, for covering freight-car roofs. Their joints are sometimes closed by a *roof cover-strip*, and sometimes the edges fit into grooves in wooden carlines or *joint-strips*. See *Car-roof*.

Roof-step (freight-car roofs). Figs. 656-7; 92, figs. 82-6. A horizontal board, which extends sidewise from the running-board to near the side of the car above the ladder, its object being to give a secure foothold and protect the roof from wear.

Roof-stick, or hoop-stick (English). 120, fig. 205. American equivalent, *carline*. A piece of timber which supports the planking of the roof, and is either bent or cut to the curve of the roof.

Roof-strap (street cars). See *Diagonal roof strap*.

Roof-strips. 1. Used quite frequently but somewhat confusingly to designate a *purlin*, which see.

2. (Passenger cars.) 14 and 17, fig. 186. Narrow wooden strips attached as stiffeners to the under side of the carlines of the lower deck.

3. (Winslow and other car-roofs.) Figs. 670-5. A longitudinal wooden strip on top of the metal roof-sheets to which the roof-boards are attached. The central roof-strip is called in other roofs a *ridge-clamp*. Sometimes at the ridge a single *ridge-clamp* is used, as 3, fig. 679.

Roof-ventilator. Figs. 1567, etc. See *Ventilator*.

Rope. "A large string or line composed of several strands twisted together."—*Webster*. See *Berth safety-rope*, *Berth-spring rope*.

Rose. Figs. 1002, etc. See *Door-latch rose*.

Ross flange brake-shoe. Figs. 247-8. A brake-shoe with a hollow in the middle where most of the rolling wear comes, and with a lip projecting over the flange. It is mainly designed for use on engines. The brake-shoe is held in position laterally by the outside and inside *flange-lips*, C and B, fig. 247. The two side portions having a bearing upon the wheel are termed the *flange* and *tread bearing-blocks*.

Rotary snow shovel. See *Snow-shovel*.

Rough-stuff, or scraping filling-coat (painting). The next coat after the *priming*, which see. Its purpose is not to protect but to level the surface of the wood. Therefore, none of it is left on the higher portions of the surface, but used merely to fill the hollows to a level with these. The surface is scraped to an even plane, level with the highest level of the bare wood. After 24 hours to dry, a second coat is put on, scraped down to the level of the highest portions of the bare wood. After a second 24 hours to dry, the car is sand papered and is ready for the *color-coats*, which see. See also *Painting*. A common material for this coat is 6 lbs. keg white lead, 7 lbs. whiting, mixed thick with coat-japan and ground in a paint-mill. This mixture is thinned with turpentine, so as to be thin enough to work easily, and so thick as not

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2048. A spiral
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pler). 23, fig.

of a mould for casting metals with spaces to be filled with molten metal.

Running-board. 4, fig. 669; 10, figs. 252-4; 87, figs. 82-133. A plane surface, made usually of boards, for train men to walk or run on. It is placed on the roof of box or stock cars and at the side of tank cars. Gondola and flat cars usually have none, but hopper-bottom cars frequently have a running-board passing over the tops of the end-rails and drop-door beam. By resolution of the M. C. B. Association at the 13th Annual Convention it was recommended "that the running-boards be not less than 18 in. wide and 1 in. thick, the ends to project $5\frac{1}{2}$ in. outside of the boarding, the projections to be supported by two braces (*running-board brackets*) made of $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. iron." Figs. 656-7 show the running-board as so specified, but the dimension is wrongly given as 2 in. by $1\frac{1}{2}$ in. The same error appears in some of the official reprints of the standards.

2. (Tank-car.) 119, figs. 139-42. The only substitute for a car-floor.

Running-board bracket. Figs. 656-7; 89, figs. 87-96. See above.

S

Saddle. "A seat or pad to be placed on the back of an animal to support the rider or the load."—*Knight*. **H2303**, a block or plate which acts as a bearing or support for a rod, beam, etc., in construction, is called a saddle. See *Body truss-rod saddle*. *Spring-saddle*. *Truss-rod saddle*. *Bolster truss-rod saddle*.

Safety-ball (Köhler stove). **L**, fig. 1474. A round cast-iron ball carried upon *safety-ball lugs*. **M**, within a spherical enlargement of the smoke-pipe in such manner that in case of the overturning of the stove the ball will close the opening to the smoke-pipe at the top so as to prevent the escape of hot coals.

Safety-ball lugs (Köhler stove). **M**, fig. 1474. See above. **Safety-beam** (passenger-car trucks). **51**, figs. 1937-63. A longitudinal timber connecting the *end-pieces* and *transom* above the axle and inside of each *wheel-piece*. Iron straps (*axle safety-bearings*) are attached to the beam and pass under the axles so as to hold them in position in case of a breakage of axles or wheels on either side. An additional *middle safety-beam* is used on six-wheel trucks, **59**, fig. 1969.

Safety-beam block. **53**, figs. 1960-62. A block fastened to the under side of a safety-beam and to which a *safety-strap* is attached. It is put there to bring the safety-beam nearer to the axle, and is usually cut out so as to conform to the shape of the latter.

Safety-beam iron. **60**, fig. 1969. A wrought-iron bar or casting bolted to the transom (six-wheeled truck), by which the *middle safety-beam* is attached to the transoms.

Safety-beam tie-rod. **59**, figs. 1955-69. A longitudinal rod alongside a safety-beam, tying the *end-piece* and *transom* together. A *safety-beam truss-rod* sometimes serves as a substitute and equivalent.

Safety-beam truss-rod. **57**, figs. 1946-7. A long longitudinal rod parallel with a safety-beam, extending from one end-piece truck to the other, under the transoms, so as to support them, in addition to serving as a substitute for *safety-beam tie-rods*, which see.

Safety-beam truss-rod bearings. **58**, figs. 1945-7. Cast or wrought-iron pieces attached to the transoms. See above.

Safety-bearing. See *Axle safety-bearing* for the *safety-beam* above. **54**, figs. 1955-73.

Safety-bearing thimbles. See *Axle safety-bearing thimbles*. **56**, figs. 1953-73.

Safety berth-latch. Figs. 1361-3 and 1363-4. A device by which it is made impossible for the berth to shut itself automatically in case of accidental overturning of the cars. In order to enable the latch to snap shut automatically, the handle must be either pulled out, as in the *Honvard safety berth-latch*, figs. 1621-2, or pushed in, as in the *Dayton berth-latch* figs. 1263-4. These devices enable the *berth safety-rope*, which see, **11**, fig. 676, to be dispensed with. Several deaths have been caused by the upper berth closing up and locking a passenger within it in cases of overturning for lack of one or the other of these devices.

Safety-chain. 1. See *Brake safety-chain* (for brake-beams), **9**, figs. 236-46. *Safety coupling-chain* (for draw-gear), figs. 428-30.

2. (English.) **46**, figs. 205-207. American equivalent, *safety coupling-chain*. An additional coupling-chain provided at one end with a hook, and intended to hold the train together should the main coupling part. Two are secured at each end of the vehicle, one on each side of the main coupling. Also called *side-chain*.

Safety-chain eye bolt. See *Brake safety-chain eye-bolt*.

Safety coupling-chain (passenger-car platforms.) Figs. 428-30; **4**, fig. 686. A chain attached to the platform end-timber and hooked to an eye in the platform of an adjoining car or tender so as to prevent the train from being separated in case the coupling should be detached. They are necessarily used in pairs, an eye and a chain with hook being attached to opposite sides of the same platform.

The safety coupling-hook represented in fig. 428 experience has shown to be somewhat too long. Two and a half inches is considered ample. When using the Miller draw-gear it not unfrequently happens that the hooks become disengaged on very sharp curves, but recouple again after leaving, the train being held together meantime by the safety coupling-chains.

Safety-flues (Winslow heater). **C**, fig. 1536, and **E**, fig. 1531. Tubes connecting the *safety-tank* with the *fire-pot*, to enable the water to extinguish the fire in the case of overturning.

Safety-grate (Baker heater). **9**, fig. 1301; fig. 1310. A perforated plate on top of the fire-pot over the fire to prevent the latter from falling out in case of overturning.

16. See above.

11. See above.

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Safety-valve ball (Baker heater). Fig. 1329. See *Safety-valve*.

Safety water-base (Bissell heater). Fig. 1386. A tank around the bottom of the stove for containing water, to put out the fire in case of the overturning of the stove. The ash-box is situated in the middle of the water-base.

Safford drawbar. Figs. 448, 453-4, 459-60, etc. A drawbar patented by J. B. Safford, which consists of cutting out a recess or "cove" in the side to give room for the hand in coupling.

Saloon. 1. "A lofty, spacious apartment."—*Worcester*.

2. The main room in a compartment car (rarely used).

3. One of the smaller subdivisions or state-rooms of a sleeping or parlor car, as fig. 211.

4. 130, figs. 155-85, 211, etc. A retiring room furnished with urinal and closet-hopper, or soil-hopper; sometimes in the more luxurious cars with a water-closet. The ladies' saloon is commonly also provided with washing facilities. Other terms are *lavatory, closet, toilet*, etc.

Saloon carriage (English). Answers the same purpose as an *excursion car*, or American *private car*. A luxurious vehicle, one or more of which is kept for hire on most English railways having one or more large compart-

from the body of the car. This separate roof, however, is not usual, the partitions being generally carried up to the roof of the car.

Saloon-seat. 121, figs. 156-92. The wooden seat over a chest-hopper.

Saloon side-light (Pintech gas-lighting apparatus, which see. Figs. 314-5).

Saloon stop-latch. Similar to figs. 985, 986, 1005-10. See *Saloon-latch*.

Saloon ventilating-jack. Figs. 1092-4. See *Ventilator*.

Sand-blast process. A process of cutting glass by blowing sand upon it with a strong blast of air. The glass is covered with paper or other elastic surface which it is found the sand does not cut at all while rapidly cutting away the glass itself. The process was invented by observing the action of sand blown by the wind upon the rocks in the western plains of the United States and is now largely used in place of *wheel-cutting*.

Sand-plank. 42, figs. 1907 to 1909. A common name for *spring-plank*.

Sash. The frame of a window or blind in which the glass or slats are set, but commonly used, especially in compound words, as a substitute for *window*, meaning the window and sash complete. The various members used in framing a sash are the same as a *door-frame*, which see.

See <i>Deck-sash.</i>	<i>Stringing-sash.</i>
<i>Door-case window-sash.</i>	<i>Upper window-sash.</i>
<i>Door-light</i> (English).	<i>Ventilator-sash.</i>
<i>Door-sash.</i>	<i>Window-blind-sash.</i>
<i>Lower door-sash.</i>	<i>Window-sash.</i>
<i>Mirror-sash.</i>	

Sash bar-lift. Figs. 1668 and 1672. A sash-lift having a projecting bar sufficiently large to be grasped by the entire hand. Chiefly used for heavy double windows, in parlor cars, etc.

Sash-fastener. A *Sash-lock*, which see.

Sash-holder. See *Sash-lock*. *Spring sash-holder*.

Sash-lift. 21, figs. 679-81, 492-5 figs. 1610, 1665-73. A metal finger-hold attached to the bottom-rail of a window-sash for raising and lowering it. They are sometimes let in flush and so called fig. 1667, but usually attached on the outside. Sometimes, but rarely, the sash-lift is a mere knob, fig. 1671, and so called. In Wolfraht's combination sash-lift, figs. 1700-2, what is ordinarily termed the sash-lift is known as the *lifting-plate*. A

window-blind lift, which see, is a somewhat similar device. See *Sash bar-lift*. *End-door sash-lift*.

Sash-lock. 22, figs. 678-95, figs. 1659-61. A spring-bolt attached to a window-sash, or (rarely) a window-blind, provided with thumb-lever (*sash-lock trigger*), to withdraw the bolt with by one hand, while the sash is lifted by the other. Both hands must thus be used. Devices to accomplish this end less awkwardly are: *Sash-balance* (figs. 1703-7), and Wolfraht's combination sash-lift and lock (fig. 1700-2). See also *Deck-sash latch*.

In the common form of sash-lock, the *sash-lock bolt* is pressed outward by the *sash-lock spring* and moved inward when desired by the *sash-lock trigger*. The bolt enters with a *sash-lock bushing*, let into the parting-strip or other part of the window-casing. In place of the bushing, *sash-lock stops*, or *sash-lock plates*, fastened upon the outside of the window-casing, or let in flush, are sometimes used, and occasionally a *sash-lock rack*. A *sash-lock lower stop* is often added at the bottom to hold the sash shut and prevent it from being opened from the outside.

The former edition of this work termed this part the *window-latch*, giving the following note:

A variety of terms are used to designate this part of a car. In most of the trade catalogues it is called a *sash-lock*, as Webster says the word *lock* is now appropriated to an instrument composed of a spring, wards and a bolt of iron or steel, used to secure doors, chests and the like. *The bolt is moved by a key*. Knight says a *lock* is a device having a bolt moved by a key, and serving to secure a door, lid or other object. The key is used for fastening car windows is therefore not properly a *lock*, because it has to rev. Of the word *latch* Webster says, "The ordinary sense of the word is, to latch, to move, stop, or make fast." Therefore *window-latch* was the term adopted to designate this device.

Sash-lock, however, seems to continue to be the established and almost universal designation, and there is room for question, as noted under *lock* and *latch*, which see, whether the distinction between them is maintained, and a *latch* has a beveled end and a *lock* a square end, instead of whether or not a key is used.

Sash-lock bolt. 1, figs. 659-61. See above.

Sash-lock bushing. Fig. 654. See above.

Sash-lock lower stop. Figs. 606, 660-2. See above and *Sash-lock stop*.

Sash-lock plate. Figs. 1655-57. A *sash-lock stop*. See above.

Sash-lock rack. Fig. 1668. See above. Wolfraht's combination sash-lift and lock, which see. A, fig. 1700.

Sash-lock spring. 3, fig. 1661. See *Sash-lock*.

Sash-lock stop. Figs. 606, 656-62. There are two kinds

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Sash-lock.

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times made in the one corresponding to concavities in the other, or a corresponding concavity in each receives a jiggle" (or packing-block).—*Knight*. Fig. 651 is a scarf joint, technically known as a *ship splice*, prescribed by the rules for interchange of traffic for splicing any broken sills but the centre sills.

Scheme-rod (postal cars). A rod supported upon the *scheme-rod bracket*, figs. 1063-8, and carrying the *scheme* or schedule of the proper distribution of mail matter for the various post-offices, used in distributing mail.

Scraper. See *Snow-scraper*.

Screen (for base-plate of Spear heater). Fig. 1506. A register-like plate permitting the entrance of cold air to the stove.

2. (For heater-room doors, wash-room panels, etc.) Fig. 1046. A perforated plate of sheet metal, usually *japaned*, which see, used as an ornamental finish.

3. (For hood of Spear and other heaters.) 7, figs. 1486-8. A perforated plate or wire netting, through which the air admitted is screened to exclude cinders.

Screw. 1. "A cylinder surrounded by a spiral ridge or groove, every part of which forms an equal angle with the axis of the cylinder, so that if developed on a plane surface it would be an inclined plane. It is considered

screw provided with a hinged weighted handle, which always hangs downward, so that it has no tendency to unscrew and slacken the coupling, and two nuts with gudgeons taking in eyes of U-shaped coupling links or shackles. The screw-coupling may be either loose, or one shackle may be attached to the drawbar.

Screw-coupling nut, and gudgeons (English). 44, figs. 205-207. See above.

Screw-coupling weighted lever (English). 45, figs. 205-207. See above.

Screw-gauges. Figs. 1832-3. Instruments for measuring the diameter or size of screws. They are of two kinds: *external*, for measuring male screws, and *internal*, for measuring female screws. See also *Screw-pitch gauge*. *Screw-thread gauge*.

Screwless knob-shank and knob. Figs. 1008-7. The chief modern style of car door-knob, which see.

Screw pitch-gauge. Fig. 1831. "A gauge for determining the number of threads to the inch on screws and taps. It consists of a number of toothed plates turning on a common pivot, so that the serrated edge of each may be applied to the screw until one is found which corresponds therewith. The figures stamped on the plate indicate the number of threads to the inch."—*Knight*. In the ordinary single thread screw, the pitch is indicated by the number of threads to an inch.

Screw-thread. Figs. 1825-34. The groove, or the material between the grooves, which is cut on the outside surface of a cylinder to form a male screw, or on the inside surface of a cylindrical hole to form a nut or female screw. *Metal* screw-threads and *wood* screw-threads, which see, are of different form. *Pipe* screw-threads, which see, are usually V-shaped, but all other threads in common use for ordinary purposes are made by the *Whitworth* or *Sellers standard screw-threads*, which see, the former being the European and the latter the American standard.

At the M. C. B. Convention, Philadelphia, 1882, it was "Resolved, That this Association deprecates the use of screws larger or smaller in diameter by a small fraction of an inch than the sizes specified for the Sellers or Franklin Institute system, and that all the members of the Association are urged to abandon entirely the use of over or under size screws."

Screw-thread gauge. Fig. 1830. A steel plate with

notches in the edge of the precise form of screw-threads, used for giving the proper form to the edges of screw-cutting tools. That illustrated is adapted to the *Sellers* system, which see, recommended by the Franklin Institute, and adopted by the Army and Navy departments of the United States, and by the Master Mechanics' and Master Car-Builders' associations. See *Sellers system of screw-threads*.

Screw-top (bell-cord hangers). 3, fig. 786, etc. A simple form of *bell-cord hanger bracket*, which see.

Scribing. The fitting of the edge of a piece of timber or metal to another more or less irregular surface. Scribing is usually done by marking a parallel line to the surface which it is designed to fit by a pair of compasses or with a *scribe-awl*.

Scroll-iron (English). 88, 90, fig. 205. A wrought-iron forging, carrying a vertical *spring-link adjusting-screw*. The form shown is a special pattern. The upper face is attached to the under side of the sole-bar, and the lower part is bored horizontally for the *adjusting-screw*. In general use on passenger service.

Scutcheon (of a lock). Fig. 1000, etc. Properly, *escutcheon*, which see.

Seals. Figs. 1108-19, 1011, 1018. See *Car-seals*. See also *Glass seal*. *Lead seal*. *Lock seal*. *Rivet seal*.

Seal-holder. Figs. 1014-15, etc. See *Paper and glass seal-holder*.

Seal-hook. Fig. 1110. An iron hook inserted into the hasp of a freight-car door, to which a seal wire and metal seal are attached. This simple form is now little used.

Seal-lock (freight car). Figs. 1011-18. A lock in which a seal made of glass, paper, or other material is inserted in the lock in such a manner as to cover the bolt or the key-hole. The lock cannot be opened without breaking the seal. See *Car-seal*.

Seal-press. Fig. 1111. A pair of levers arranged like a pair of pincers, with two dies in which lead car-seals are compressed on the wire to which they are attached, leaving an impression on the lead so that if the seals are removed or defaced it can be known. Similar seal-presses are used for eyelet shackles.

Seal-wires. Figs. 1109-19. Several strands of fine wire twisted together like a rope, or single bars of twisted flat wire, by which leaden seals are attached to car-doors.

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, figs. 1108-9.

205, 206. An about $\frac{1}{4}$ inch joints in the to any textile lapped round a ed inside. It

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Special forms of seat-arms are the *solid nipple seat-arm*, which see; *Cobb's pivoted seat-arm*, designed to enable the back to be raised higher; *Gardner's geared seat-arm*, fig. 1131, designed to change the slant of the seat when the back is reversed, and *Buntin's seat-arm*, fig. 1139, which unites the seat and seat-back in one piece.

This term is also used to designate the portion of a seat-end (more properly called *seat-end arm*), which supports the arm of a person sitting in the seat, as 5, figs. 1120 and 1122; and sometimes, incorrectly, to designate an *arm-cap*, figs. 1197-8, which see.

Seat-arm pivot. Figs. 1167-9. A metal pivot by which a *seat-arm* of a reversible seat is attached to a *seat-end* or the side of a car. In some cases, as fig. 1174, the pivot is made in one piece with the *seat-arm plate*, which is attached to the seat-end. The two combined then become a *seat-arm pivot-plate*, which see. A *seat-back arm pivot* or *swing-joint* is used in Cobb's pivoted seat-arm, fig. 1171. A seat-arm pivot is sometimes called in the trade a *seat-arm rivet*. The most improved form is a *solid nipple seat-arm pivot*, fig. 1168.

Seat-arm pivot-plate. Figs. 1172-4, 1179. See above.

NOTE.—Figs. 1172-3 should be entitled in the engravings seat-arm plate instead of seat-arm pivot-plate, since they

other way. In some cases on steam cars, and usually on street cars, *longitudinal seats* are used, with the backs against the side of the car. See *Slat seat-back*. *Flexible-top seat-back*. *Sectional seat-back*. The *Buntin seat-end*, which see, has the seat and seat-back in one.

Seat-back arm. A *seat-arm*, which see.

Seat-back-arm pivot. 1. (Cobb's pivoted seat-arm, which see.) 3, figs. 1171, 1182. The *swing-joint* or *seat-back pivot* in the seat-arm.

2. A *seat-arm pivot*, which see.

Seat-back band. Figs. 1199-1204. A *seat-back moulding*, which see.

Seat-back board (street cars). 42, figs. 1848-4. A board placed between the two *seat-back rails* of a longitudinal seat. Usually made in the form of a raised panel so as to make a comfortable rest for the back.

Seat-back corner (emigrant sleeping cars). Fig. 1298. A brass corner-plate carrying a lug to guide the back when making up the seats into berths.

Seat-back curved-stop. 14, fig. 1120; figs. 1126, 1181-2.

A *seat-back stop*, which see, of a curved form, resembling somewhat a letter S.

Seat-back moulding. 12, figs. 1120-2; figs. 1199-1204. A wood or (usually) metal band or moulding fastened around the edge of a seat-back to give it a finish and protect it from wear.

Seat-back pivot (Cobb's striker-arm). Figs. 1171, etc. The pin by which the seat-arm is pivoted to the back. See *Cobb's pivoted seat-arm*. It should not be confused with a *seat-arm pivot*, which see.

Seat-back rail (street cars). Figs. 1848-6. Two narrow rails, *upper* and *lower*, which form the top and bottom of a longitudinal seat inclosing the *seat-back board* between them.

Seat-back round-stop. Figs. 1182-4. A round *seat-stop* which see.

Seat-back slats. Narrow strips of wood used to form a seat-back; used chiefly for seats which are not upholstered.

Seat-back spring. A weak spring placed in the upholstering in the back of a seat. Usually called simply *back-spring*.

Seat-back stop. See *Seat-stop*, 14, figs. 1120-4, 1125-6, 1181-4.

Seat-board (English). 150, figs. 205-6. In a carriage, the support for the *seat sofa-springs*. These springs are tied down, and a piece of canvas is stretched tightly over them, the cushion resting on this canvas.

Seat-bottom (street cars). 34, figs. 1848-4. The boards or floor in a seat-frame on which a cushion rests, or on which persons sit when no cushion is used. It is attached to the *back* and *front seat-bottom rails*.

Seat-bottom rail. See above.

Seat-bracket (hand-car). 13, figs. 1720, 1728. A wrought-iron knee which supports the seat.

Seat-bracket brace (hand-car). 14, fig. 1728.

Seat-cord (Mann boudoir car). 4, figs. 690-1. A cord used to hold up the lower seat while removing the bedding for night use.

Seat-cushion. Figs. 1205-26. A soft pad or pillow on which passengers sit. Two kinds of cushions are used on cars: a *squab-cushion*, which is a loose pad and is now little used, and *box-cushion*, which is a cushion built upon a *cushion-frame*, with springs, etc. See *Back-squab* (English).

A great variety of forms of seat-cushions exist, the leading ones of which are shown. Special forms, separately defined, are, as respects material, *woven wire*, *rat-tan* or *cane*, *canvas-lined*; as respects mode of construction, *flexible-top*, *elliptic*, *broad-band elliptic*, *spiral-elliptic*, *Bushnell*, *spring-edge*, *sectional*, *drop-down frame*, etc., etc.

2. (English.) 196, figs. 204-6. American equivalent, *squab cushion*. In a first-class carriage, a flat, loose *squab* cushion, about four inches thick, covered with broadcloth on one side and leather on the other, and stuffed with curled horse hair. It is *reversible*, and often so called.

Seat-division (longitudinal seats). 126, figs. 161-6. A bar of wood or metal to separate the space occupied by a passenger from that adjoining it.

Seat-end. 123, figs. 155-85; 2, fig. 1120; 3, fig. 1123; figs. 1192-1204. A frame of wood or metal at the end of a car-seat which supports the arm of the occupant and to which the seat-arm is attached. Seat-ends are designated *long* or *short*, according to whether they extend entirely to the floor or are supported upon a *seat-stand*, 6, fig. 1120. They are also designated as *aisle seat-ends*, or *wall seat-ends*, and, for corner seat-ends, as *left-hand* or *right-hand seat-ends*, which see.

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front and back, resting on and attached to the seat-end and to the side of the car, and which supports a cushion-frame or seat-bottom.

Seat-rail bracket. Figs. 1187-8. A support for a wooden seat-rail. In iron seat-ends it is frequently cast upon it.

Seat-rail knee (English). 119, figs. 204-205. A piece of wood secured to the door pillar and supporting the seat-rail. It is generally slotted to receive a leather strap, restraining the undue opening of the door.

Seat-rail support (English). 119, figs. 204-5. A piece of hard wood supporting the seat and securing it to the side of the body of a carriage. It is often pierced for a leather strap limiting the opening of the door.

Seat-riser. 1. (Street cars). Figs. 1843-6. A vertical board or front of a seat, extending from the seat-rail to the floor; seldom used with reversible seats.

2. (Hand-car). 15, figs. 1720-3. A *rave*, which see.

Seat-slat. A narrow strip of wood which forms part of a seat-bottom.

Seat-spring. Figs. 1209-29. A spiral or other metal spring used to give a seat elasticity. *Spiral* springs are the most common, but *elliptic* and *spiral-elliptic* are also used. A special form of seat-springs called *back-springs*, of little resistance, is used for seat-backs. English seat-springs, 203, fig. 205, are called *sofa-springs*, and the

rod which connects one end of a floating-lever with one of the brake-levers.

2. (Tanner or Elder brake.) 6, figs. 228-35; 152, fig. 106; 133, figs. 1843-6. A rod which connects the centre brake-lever, Tanner or Elder brake, with one of the brake-levers on the truck. On a four-wheeled car it is the rod which connects the centre lever with one of the brake-beams.

Second-class car. A plainly-finished passenger car for carrying passengers who pay a lower rate of fare than first-class passengers do. Such cars are rarely used, the smoking car usually serving this purpose for the small number of so-called second-class (in reality, third-class) passengers. See *Coach*. *First-class car*.

Second-class carriage (English). A vehicle adapted to carry passengers paying an intermediate rate of fare, the fittings being less expensive and comfortable than in the first-class. Each compartment measures about 6 feet in the length of the carriage and seats 10 passengers. See also *Carriage*.

Section. 1. (Of a seat-cushion). Figs. 1215-6. See *Sectional seat-cushion*.

2. (Of a sleeping car, which see.) Fig. 678. Two double berths, one above the other, making up into two seats facing each other by day. There are from 8 to 12 sections in a car, usually 10, besides the state-rooms.

Sectional seat-cushion. Figs. 1214-20. One with spiral springs separately attached to narrow slats so that the seat can be made up or repaired in sections.

Sector. In geometry: "A part of a circle included by an arc and the two radii drawn to its extremities."—*Davies*. Hence, any object whose shape is that of a part of a circle ought to be called a sector, but as a matter of fact it is generally called a *quadrant*. See *Deck-sash quadrant*. *Drawbar-sector*. See also *Quadrant for grain-door*, 3, figs. 373-6.

Self-acting ventilator. Figs. 1553-69. An *automatic-ventilator*, which see.

Self-closing faucet, or cock. Fig. 1591. A faucet having a horizontal bar-handle provided with a spring by which it is closed when released. *Telegraph-cocks*, which see, figs. 1592-5, and also *compression-cocks*, fig. 1596, are also self-closing, but not distinctively so-called.

Self-fitting journal-bearing. Figs. 1993-4. See *Hopkins' journal-bearing*.

Self-loading truck (Johnson's, which see). Fig. 1906.

Self-locking or spring padlock. Figs. 1031, 1036-7.

One which snaps locked by pressure only, without using a key, in distinction from a *dead* padlock.

Sellers system of screw-threads. Figs. 1829, 1834. A system of screw-threads designed by William Sellers, of Philadelphia. The following table gives the number of threads to the inch and the proportion of the threads of the Sellers system. See also fig. 1834.

TABLE GIVING PROPORTIONS OF THE SELLERS SYSTEM OF SCREW-THREADS.

Outside diameter of screw in inches.....	Number of threads per inch.....	Diameter of screw at the root of the thread in decimals of an inch.....	Width of top and bottom of thread in decimals of an inch.....	Outside diameter of screw in inches.....	Number of threads per inch.....	Diameter of screw at the root of the thread in decimals of an inch.....	Width of top and bottom of thread in decimals of an inch.....
$\frac{1}{8}$	20	.185	.0062	1	8	.837	.0156
$\frac{1}{4}$	18	.240	.0074	1½	7	.940	.0178
$\frac{3}{8}$	16	.294	.0078	1¾	7	1.065	.0178
$\frac{1}{2}$	14	.344	.0089	1½	6	1.160	.0208
$\frac{5}{8}$	13	.400	.0096	1¾	6	1.284	.0208
$\frac{3}{4}$	12	.454	.0104	1½	5½	1.389	.0227
$\frac{7}{8}$	11	.507	.0113	1¾	5	1.491	.0250
$\frac{1}{2}$	10	.520	.0125	1½	5	1.616	.0250
$\frac{1}{2}$	9	.731	.0138	2	4½	1.712	.0277

The form of the threads is an essential part of the system and is shown in fig. 1829. The angle at which the sides of the thread stand to each other is 60 degrees, and the top and bottom of the threads are made flat. The proportions of the threads are determined by the following rule given by Mr. Sellers: "Divide the pitch, or, what is the same thing, the sides of the thread, into eight equal parts; take off one part from the top and fill in one part in the bottom of the thread; then the flat top and bottom will equal one-eighth of the pitch, the wearing surface will be three-quarters of the pitch, and the diameter of screw at bottom of the thread will be expressed by the formula:

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smaller than the groove in the body, and the plate is not screwed up tight, leaving about $\frac{1}{8}$ of an incl. play. Thus $\frac{1}{8}$ inch is left in case of breakage to relieve the strain on the tire before it comes on to the fastenings.

Set-screw, or stud-fastening (English). Figs. 2153, 2154, 2179-80. As applied to railroad wheels, a mode of securing the tire to the wheel which is becoming obsolete. A modification is the *set-screw fastening* (English), *plain-end*, fig. 2154. Though superior to the other it is being superseded by better methods. See *Tire-fastening*.

Setting-die (for carpet-eyelets). No illustration. A device, one form of which is very similar to fig. 1103, for forming eyelets by compressing the grommets together. Usually, however, with large eyelets, it is done with a hammer.

Seven-group spiral-spring. Fig. 2080. See *Spiral spring*.

Sextuplet (of elliptic springs). Six elliptic springs coupled together, side by side, to act as one.

Shackle. 1. (Of a padlock.) **A**, figs. 1029-30, etc. A U-shaped bar which is passed through the *staple* in front of the *hasp* by which the padlock is used to lock the object. The inner end **D** of the shackle is termed the *heel*, which is sometimes provided with the *shackle spring*.

Shade-cap (of a lamp). 33, figs. 837-71. A vertical tube extending the shade upward and constituting in effect an extension of the chimney. A similar part for a lamp-globe is called a *globe-chimney*.

Shade-ring. Figs. 987-9. See *Adjustable shade-ring*. Also called *wire tripod*.

Shade-roller (for window-shades.) Figs. 1688-6. A device serving the purpose which its name implies, the only forms of which now in general use are the *automatic* forms, which hold the shade in any position when released by means of *centrifugal-pawls*, which see. The leading styles are the *Hartshorn* shade-roller and the *McKay* shade-roller, which see. The Hartshorn works with a pawl on the end, while the McKay has a cam. There is no conflict of patent.

Shaft. "That part of a machine to which motion is communicated by torsion."—*Webster*.

See *Brake-shaft*.

Crank-shaft.

Door-shaft.

Driving-shaft.

Drum-shaft.

Horizontal brake-shaft.

Lever-shaft (street cars).

Winding-shaft.

Shaker. See *Grate-shaker*. *Shaker-handle*.

Shaker-door (Johnson heater). 19, fig. 1472.

Shaker-door frame (Johnson heater). 20, fig. 1473.

Shaker-handle (Bissell heater). Figs. 1899, 1890.

Shank (Kirby's car-door lock). A', figs. 1003-4. The spindle. See also *Buffer-shank*. *Grate-shank*. *Lock-shank*.

Shank-facing (Kirby's car-door lock). P, figs. 1003-4.

Shears (of a pile-driver car). Figs. 1821-4. The tongs which grasp the *hammer*, which see.

Sheathing. 52, figs. 82, 96, etc. Boards which are tongued and grooved, and with which the sides of cars are covered. The sides of a gondola car are ordinarily termed *side-plank* and *end-plank*, and are much heavier than the sheathing of a box-car. *Inside sheathing* is sometimes used, leaving the side-frame of the car exposed. *Inside lining*, which see, is in addition to the ordinary outside sheathing.

Sheave. A wheel, roller or pulley over which a cord or rope runs, or on which any object, as a door or window, rolls. *Sheave* is often used to designate a block or pulley, but more properly it designates simply the grooved wheel in the block. See *Pulley*.

See also *Bell-cord sheave*. *Main sheave*.

Brake-lever sheave.

Brake-shaft-chain sheave.

Centre brake-lever sheave.

Door-sheave.

Pile-hoisting sheave.

Sliding-door sheave.

Strap-sheave.

Sheave-hook (derrick cars). 2, figs. 77-78. The hook carried at the lower end of a *hoisting-block* to which the load is attached.

Sheave-pin, or *pintle*. 5, figs. 77-78. The axle of a sheave. See *Pintle*.

Sheet iron. Iron rolled thin and, in car work, usually *galvanized*. Its thickness is given by its number of *wire gauge*, which see. The standard sizes are 6 and 8 ft. long and 24, 26, 28, and 30 in. wide. It is, however, manufactured to order up to 10 ft. long and 44 in. wide. *Sheet steel*, *galvanized* or not, is now also largely manufactured.

Sheet-ring and staple (English). 80, figs. 116-9. A small wrought-iron ring to which are tied the cords attached to the edges of the tarpaulin protecting the contents of an open wagon from the rain.

Sheffield hand-car. Figs. 1712-9. A name applied to several varieties of hand-cars, taken from the name of the designer, but more particularly applied, *first*, to an ordinary section hand-car with wooden wheels, and *secondly*, to a three-wheel hand-car for inspection purposes.

Shelf. See *Spring-shelf* (street-car journal-boxes).

Shell. See *Berth-latch shell*.

Shelled-out (car-wheels). A term applied to wheels which become rough from circular pieces shelling out of the tread, leaving a rounded flat spot, deepest at the edge, with a raised centre. The M. C. B. rules for *interchange of traffic*, which see, specify that no wheel shall be condemned for this fault unless the spots are over 2½ in. in length, or their number is so great as to interfere with the safe running of the wheel.

Shield (Gouge heater). Fig. 1466. A plate covering the opening formed by the *shield-bar*. The *shield-feet* hold out the shield from contact with the deck-sash so as to leave an opening to admit air.

Shield-box valve (Gouge heater). Fig. 1441. A box for the escape of bad air, projecting through the deck-sash and connecting with the *exhausting weather-cap*, fig. 1406.

Shield-feet (Gouge heater). 93, fig. 1444. See *Shield*.

Shifting-pinion (hoisting-gear). 13, figs. 77-78: W, figs.

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1324. A wooden cover for a window, especially one having no sash.

Side. See *Deck side*. *Ladder-side*. *Truck-side*.

Side arm-rest, or elbow rest (English). 201, figs. 204, 205, 206. A wooden support for the elbow attached to the inner sides of a carriage beneath the windows, and padded with horsehair and covered with broadcloth or leather. See also *Folding arm-rest*. In American cars a *window-ledge* is made to serve the same purpose, but *arm-rests*, 26, fig. 678, are generally added in sleeping-cars. They are mere round bars, covered with plush, but not padded.

Side-bearings. Supports placed on each side of the centre-pin of a car, to prevent too much rolling or rocking motion of the car-body. Usually there is a plate of iron or steel attached to the body-bolster on each side of the centre-pin, called a *body side-bearing*, 16, figs. 83-95, etc.; 14, figs. 163-85, etc., and a corresponding plate, block or roller on the truck-bolster, called the *truck side-bearing*, which see, 61, figs. 1907-69. They are also distinguished as *lower* and *upper* side-bearings. Generally there is a little space left between the bearings, so that the truck can turn freely on the

Side body-brace rod. 34, figs. 89, 98; 52, figs. 177-8.

See above.

Side-casting. Fig. 447. See *Drawbar side-casting*.

Side foot-rest (passenger cars). 10, fig. 1122, etc. A metal plate fastened to the truss-plank between the seats, for passengers to rest their feet on. Chiefly used over heater-pipes as a guard to prevent the feet of passengers from coming in contact with the hot pipes.

Side-frame. 1. (Of a car-body.) Figs. 82-845. The frame which forms the whole side of a car-body. It includes the posts, braces, plate, rail, girth, etc. See *Framing*.

2. (Of a truck.) Figs. 2025-2080. See *Truck side-frame*. *Diamond-truck*.

Side-gutter, or outside-cornice (English). 132, figs. 204-7. A piece of wood secured on the outside of the vehicle at the angle of the roof to the sides. It is channeled on the top to catch the rain and convey it to the ends of the vehicle, to prevent it running down the sides.

Side-gutter moulding (English). 132, figs. 204-7. A moulding which is attached to the outer side of the side-gutter in order to hide the heads of the bolts by which it is secured.

Side hopper-plates (hopper-bottom cars). 28, figs. 100-12. In distinction from the hopper-plates proper, which form the inclined floor.

Side journal-spring (street cars). 6, figs. 1848-4. One of a pair of spiral or rubber springs which rest on ledges on each side of a journal-box.

Side-lamp. Figs. 851-71. A lamp attached to the side of a passenger car. In distinction from a *centre-lamp*, which hangs from the roof; they are usually made with brackets by which they can be conveniently fastened. See also *Alcove-lamp*.

2. (English.) American equivalent, *side tail-light*. A colored signal lamp carried at the side of the last vehicle of a train. Two red *side-lamps* and one red *tail-lamp* are generally carried, arranged in the form of a triangle.

Side-lamp braces. 18, fig. 859. Diagonal bars attached to a side-lamp and to the side of a car to steady the lamp.

Side-lamp bracket. 17, fig. 858. See *Side-lamp*.

Side-lamp holder. 16, fig. 859. A metal ring or bowl-

shape receptacle usually attached to a bracket to hold a lamp.

Side-lamp iron (English). 184, figs. 205 and 207. American equivalent, *tail-light holder*. A wrought-iron lamp-holder secured to the outer side of the body to carry the colored *side-lamp*, which see. See also *Signal-lamp*.

Side-pawl (Creamer brake, which see). 10, figs. 262-4.

Side-piece (for platform-hood). 10, fig. 186. A thin block cut to the curve of the hood.

Side-plank (gondola cars). 196, figs. 112-3. The boards bolted to the stakes constituting the sides of the car. They vary from 2 to 8 ft. or more in height according to its capacity and are generally 2 in. thick. Those at the end of the car are termed *end-planks*, and are usually hinged at the bottom so as to drop down inwardly on to the floor of the car.

Side-plate. 46, figs. 85-135; 98, figs. 155-176; 47, figs. 1843-46. More properly, simply *plate*. The longitudinal stick on top of the posts of the car-body. No called as distinguished from the *end-plate*.

Side-pulley (of bell-cord guides, which see). 1, figs. 722-5.

Side-rest (tip-car). 160, fig. 148. A block of wood or metal on top of the frame on which the body rests when tipped.

Side-seat. Figs. 1217, 1843-6. A longitudinal car-seat, the back of which is against the side of a car. See *Car-seat*.

Side-sills, or outside-sills. 1, figs. 82-104 and 155-176; 8, figs. 1843-46. The exterior *sills*, which see. Sometimes the outside-sills only are referred to by the single word *sill*, but this use of the word is uncommon. The side-sills are usually made deeper than the inside-sills in flat and gondola cars, but not in *box* and *stock* cars. In tank cars and some coal cars they are the only sills. From side-sills are usually *channel-bars*, which see, the examples shown in figs. 144-9 being an 8-inch channel-bar weighing 52 lbs. per yard. The centre and intermediate sills are 8-inch I-beams, which see, weighing 45 lbs. per yard.

Side-spring (Janney-Miller coupler). 55, fig. 602. A spiral spring actuating the Miller hook laterally. The Janney coupler, from its peculiar rack movement of the knuckle or coupling-hook in coupling, requires no side-play.

Side-spring bolt (Janney-Miller coupler). 52, figs. 554, 555-601. The bolt securing the side-spring in place.

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59-60, figs.
 in connection

4. A ledge
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by a clapper, to which a strap is attached which extends from one platform to the other.

2. (Locomotives.) A similar bell to which the *bell-cord* is attached.

Signal-holder, or igniter. Fig. 1043. A device for burning blue-lights and igniting them by friction, produced by pushing in a piston. See also *Torpedo*.

Signal-lamp, or signal-light. Figs. 956-71. A name applied to lanterns of extra power and quality of several kinds, but usually meaning those provided with *semaphore* or *bull's-eye* lenses, which see, of which from one to four are used, whence the name single-lens, double-lens, etc. They are also called *side tail-lights*, *tail-lights*, *operator's signal-lights*, etc. A special variety having changeable colors are *inspectors' lanterns*, figs. 960-73.

Signal-pipe (Westinghouse train-signal apparatus, which see). G, fig. 687; 27, figs. 324-5. A continuous pipe running from car to car through the train, substantially a duplicate of the brake-pipe, but working with a much lower pressure of air. The *signal-pipe couplings* are also substantially similar to brake-hose couplings, but have a thicker lip, so that they cannot be misconnected with

Signal-whistle (Westinghouse train-signal apparatus).

F, fig. 786. See *Signal-valve*.

Sill. 1. "Properly, the basis or foundation of a thing; appropriately, a piece of timber on which a building rests. The lowest timber in any structure, as the sills of a house, of a bridge, of a loom, and the like.

2. "The timber or stone at the foot of a door; the threshold.

3. "The timber or stone on which a window-frame stands, or the lowest piece in a window-frame."—*Webster*.

4. (Car building.) Figs. 82-185, etc. The main longitudinal timbers, usually six but sometimes eight in number, which are connected together transversely by the *end-sills*, *body-bolsters*, and *needle-beams* or *cross-frame tie-timbers*. Sills are divided into *outside sills*, or simply *side-sills*, *intermediate sills*, and *centre-sills*. Sometimes the word sill is used referring only to *outside sills*, but this use is unusual. A few cars, such as dump cars, and tank cars, figs. 189-142, have but two sills, and others, as in figs. 105-108, only four. The splice for broken sills required by the regulations for the interchange of cars is shown in fig. 651. It is required to be 24 in. long.

See also *Deck end-sill*.

Deck-sill.

End-sill.

Platform end-sill.

Platform-sill.

Platform short-sill.

Short-sill.

Swinging platform-sill.

5. The lower horizontal member of the frame surrounding a window or door. See *Door-sill*. *Window-sill*.

Sill-and-plate rod. 36, figs. 87-142; 54, figs. 155-78. A vertical iron rod which passes through the sill and plate of a car-body frame and ties the two together. A *brace straining-rod*, which see, is a similar part for low passenger-car trusses below the windows.

Sill knee-iron. 9, figs. 89-95; 8, figs. 170, 182. An L-shaped or right-angled iron casting or forging bolted into the inside corner of a car-frame to strengthen it.

Sill-splice. Fig. 651. See *Ship-splice*.

Sill-step (freight cars). 30, figs. 82-148; figs. 656-7. A U-shaped iron attached to the sill of a car, below the ladder, as a step for getting to or from the ladder. The M. C. B. Association recommended, Chicago, 1879 (figs. 656-7), "That two good substantial steps (*sill-steps*),

made of wrought iron $\frac{1}{2}$ by $1\frac{1}{2}$ in., be fastened, one to each side-sill, at diagonal corners of the car."

Sill-step stay. 31, figs. 109-4, 139-41. A diagonal iron rod or bar attached to one of the sills and to a sill-step to stiffen the latter. Not commonly required or used.

Sill tie-rod. 10, figs. 108, 140-2; 9, figs. 153-85. A transverse tie-rod in the floor of a car for holding the sills together.

Single-board car-roof (freight cars). Figs. 664-5. A roof, of which several varieties other than those shown exist, in which one layer of boards covered by some kind of sheet metal is used in place of double boards. All single-board freight roofs use a sheet-metal cover, either above or below the boards, but those only having sheet metal on top are commonly so called.

Single or end berth-rest (emigrant sleeping-berths). **N**, figs. 682-5. A bracket to support the berth when open. So called in distinction from the berth-rests proper (double) on the berth-posts.

Single-driver steam brake (American Brake Co.). See remarks to figs. 343-5. See also *Driving-wheel brake*.

Single-edge weather-strips. Fig. 1698. See *Weather-strip*.

Single-guard (for lanterns). Fig. 981. According to the number of horizontal wires surrounding the globe, lanterns are designated as *single*, *double* or *triple-guard*.

Single-hole clevis (Am. aut. comp. brake). 26, figs. 868-9. So named in distinction from the *three-hole clevis*, both being a part used to connect the *lower connecting-rod* to the brake-lever.

Single-lever brake. Figs. 280, etc. A brake which has but one lever to a truck or four-wheeled car, which see, to apply to two brake-beams. In some cases applied to but one of the trucks of a car; in other cases, to both. An objection to this form of brake is that the pressure is not equal on each brake-beam. To overcome this difficulty two levers are used, and the brake, as shown in fig. 281, is then called a *double-lever brake*, which see.

Single pipe-strap. Fig. 1833. A pipe clip, which see.

Single-plate wheel. Figs. 2131-2, 2144-5. A cast-iron wheel, in which the hub and tire are united by only a single plate, which is strengthened usually by ribs called *brackets*, fig. 2131, or sometimes by *corrugations*, fig. 2144-45. See *Wheel*. *Car-wheel*.

Single sash-spring. Fig. 1649. See *Sash-spring*.

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Car-truck.
Another term
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which make up by day into ordinary seats, as shown in
figs. 676-8. By far the greater number of the sleeping
cars are operated by the Pullman Palace Car Co., and
are hence often referred to simply as *Pullman* cars. The
Mann boudoir car, which see, is an American in-
vention recently re-introduced from Europe. *Emigrant*
sleeping cars, figs. 195, 203, which see, have recently been
introduced, resembling ordinary sleeping cars, but with-
out upholstery.

The first sleeping car built in the United States was made in
the shops of the Terre Haute, Alton & St. Louis Railroad by a
mechanic named Woodruff. The coach provided seats for
sixty passengers, which were convertible into flat berths. The
patent was secured in 1856-7. The next sleepers were two of
the same kind run on the New York Central Railroad. Web-
ster Wagner, founder of the Wagner Palace Car Co., built and
patented four sleepers for the New York Central Railroad in
1858. The modern palace sleeping car was introduced by
George M. Pullman, who built his first car in 1859. Some of
the early Pullman cars had sixteen wheels instead of twelve.
The first Wagner palace car was built in 1867. Both Wagner
and Pullman paid royalties to Woodruff.

See *Sleeping-car section*. *Lower-berth*. *Upper-berth*.
Sleeping-car furnishings. Figs. 1281-99.
Sleeping-car section. The space in a sleeping car occu-
pied by two double seats in day-time and by two berths

Slide-pin (Cowell platform and coupler). 3, fig. 588. The bar connecting the *rock-lever* 2 with the *sleeve* 4 on the *cross-bar* 5. When forced forward by operation of the *adjusting wedge* 6 it transmits the pressure to the *buffer-springs* 14.

Slide-valve (Westinghouse triple-valve). 6, figs. 382-3, 353; 5, figs. 355-7. A D-valve controlled in its motion by the piston, by means of which the air is admitted to, and exhausted from, the brake-cylinder, applying and releasing the brake. See also *Reversing valve*.

Sliding-bolt (of a padlock). B, figs. 1029-30; 3, fig. 1031. The bolt in the interior of the padlock which engages with the *shackle*, locking it to place. The forward end of the bolt is termed the *bit*. The movement of the sliding-bolt is controlled by the *sliding-bolt spring* H.

Sliding-door. A door opened by sliding sideways instead of swinging on hinges. Such doors are almost universally used on freight-cars. They are hung by a hook called the *door-hanger*, which slides on a top door-track. See also *Car door-hanger*.

Sliding-door bracket. A *door-track bracket*, which see.

Sliding-door fixtures. Figs. 371-2, 791-801. See also *Car-door hanger*, *sliding-door lock* and *latch*.

Sliding-door friction-roller. Fig. 1855. A small wheel attached to the top of a sliding-door to make it run easily. It does not carry the weight of the door.

Sliding-door pull (parlor-car doors). Fig. 747. A device having a handle which can be pulled out to open the door, and then closed up flush with its face.

Sliding-door handle. 1. 6, figs. 746-9, 990.

2. (Street cars.) 91, fig. 1345; fig. 1851.

Sliding-door holder (street cars). Fig. 1851. A metal hook by which a sliding-door can be fastened on the inside.

Sliding-door latch. Figs. 746-9, 990, 1856. A latch made with a hook lifting vertically instead of a bolt sliding horizontally, for fastening sliding-doors.

Sliding-door-latch keeper. Fig. 1857. Also called a *strike-plate*.

Sliding-door-latch plates (street cars). 92, fig. 1845; 1, fig. 1851.

Sliding-door lock. Figs. 746-9, 991. A lock made especially for fastening sliding-doors. Such locks usually have a hook which engages in a corresponding catch attached to the door-post. The hook is secured in con-

nection with the catch by means of a bolt which is operated by a key.

Sliding-door sheave (street cars). Fig. 1854. See *Door-sheave*.

Sliding-door track. See *Door-track*.

Slip lamp-burner. Figs. 880-3. A burner in which the chimney is held in place by springs or screws, and so constructed that the entire slotted cap to the burner may be removed at once by lifting, still carrying the chimney, without removing any spring.

Slip lamp-chimney. Fig. 984. A chimney with cylindrical base, held in place by lateral springs, so as to be removable by lifting only. Similar to a *sun chimney*, which see, but smaller at the base.

Sloping closet-hopper. Fig. 1096. See *Closet-hopper*.

Slow-motion gear (of a derrick or crane). 10, figs. 77-8; X, figs. 151-153. A system of gearing, intended to be used or not at will by means of a *shifting-pinion*, to decrease the speed and increase the power of the hoisting-gear. Called also *intermediate gear*.

Small equalizing-guide (Janney-Miller coupler, which see). 49, figs. 542-554, 555-601. See also *Equalizing-guide*.

Small window (passenger cars). 139, figs. 164-8. A subordinate window between the main windows. The tendency is to abandon their use.

Smith vacuum brake. Figs. 289-92. A system of continuous brakes, invented and patented by Mr. J. Y. Smith, operated by exhausting the air from flexible india-rubber cylinders or bags, resembling the bellows of an accordion, which are placed under each car. One end of these cylinders is attached to the car-body and the other is connected by a rod to a system of brake-levers. When air is exhausted from the cylinder the pressure of the air on the outside of the movable head is communicated to the brake-levers and thence to the brake-shoes. The air is exhausted by an *ejector* on the engine, which is connected with the india-rubber cylinders by pipes and flexible hose between the cars.

Smoke-bell. 13, figs. 837 $\frac{1}{2}$, 843; 27, figs. 680-1. A cover or screen of glass, porcelain or metal, shaped somewhat like a bell, and placed over a lamp to protect the ceiling of a car or room. Large smoke-bells are often called *canopies*, as A, figs. 841-3 (Harrison postal-car chandelier).

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one open to passengers with second-class tickets. *Buffet smoking-cars*, which see, and some others, are more luxurious.

Smoking carriage (English). A passenger vehicle in which smoking is allowed. The whole of a vehicle is seldom devoted to this purpose, separate compartments of each class being set apart for smoking in every train, as required by law. See also *Carriage*.

Smoking-chair (parlor cars). Fig. 1161. A chair distinguished from other parlor-car chairs chiefly in being less roomy and comfortable.

Smoking-room (sleeping cars). Figs. 210-12. A compartment now almost universal in modern sleeping cars and parlor cars. It is generally kept for the free use of the passengers, and separate seats or berths are not sold in it. See note to fig. 209.

Smudge (English). The scrapings and cleanings of paint pots collected and used to cover the outer side of the roof-boards as a bed for the *roofing canvas*, which see.

Snatch-block. Fig. 1888. Properly a single block which has an opening (*notch*) in one *cheek* to receive the rope. The snatch-block is usually provided with a *swivel-hook*. The term is also popularly applied to any form of single

running at from two to three hundred revolutions per minute, sliding off the snow for a width of ten feet and depositing it on a rotating fan-wheel behind, revolving in a drum at the same rate of speed as the knife-wheel, which throws the snow through a shoot on the top of the drum, to some distance from the track. This machine carries its own flanger, cleaning the flange every time it passes over the road. The knife-wheel and shovels are driven by two stationary engines, with their own boiler, tank and coal-bunk complete, carried upon a separate car. The device is not yet in general use.

Snow-scraper. A, fig. 70. A plate or bar of iron or steel attached to an engine or car to scrape away the snow and ice from the rails.

Snow's steel-tired car-wheel. Figs. 2162-4. A form of wheel the distinguishing feature of which is the *independent hub*, so formed that the entire wheel can be removed when the tire needs re-turning, leaving the hub upon the axle. The other parts of the wheel are the *tire*, the *internal flange*, *back* and *front face-plates*, bolted to the tire and to the hub, and the *central filling-piece*, which constitutes the outer portion of the wheel-centre.

Soap-dish. Figs. 1579-80; 6, fig. 1570.

Soap-holder. Figs. 1570-8. A soap-dish attached to a partition like a bracket.

Socket. "Any hollow thing or place which receives and holds something else."—*Webster*. As the socket for water-cooler valve, fig. 1597.

See also *Berth-curtain rod bushing, or socket.* *Revolving-chair stand socket.*
Flag-holder socket.

Socket-caster. Figs. 1147, etc. A fixed or rigid caster. Not properly a caster at all, except by custom of the trade. See *Caster*.

Socket-washer. Fig. 1878. A large washer with a cavity to receive the head or nut of a bolt or rod so that it will not project beyond the surface of the wood to which it is attached. Also called *cup-washer*.

Socket-wrench (Gouge heater). Fig. 1446. A tool for shaking and dumping the grate.

Sofa (sleeping cars). A longitudinal seat which makes up by pulling out sideways so as to drop the back. Now used only in staterooms. Formerly sometimes used for all the berths in a sleeping car.

Sofa-back (Mann boudoir cars). B, figs. 680-1. The part which makes the upper berth.

Sofa-bolt (sleeping cars). Figs. 1241-2. A sliding bolt used for holding a sofa in its place. It is operated from

the front by a *sofa-pull* working through a *sofa-crank*. Sofas standing against the side of the cars are now little used, however.

Sofa-caster. Fig. 1146. See *Caster*.

Sofa-hinge. Fig. 1383. A hinge by which the seat and back of a sofa are fastened together so that they can be changed from a sofa into a bed. See *Seat-hinge*.

Sofa-spring (English). See *Seat sofa-spring*. *Back-squab sofa-spring*.

Soffit-board. 121, fig. 174. A board which forms the under side or ceiling of some subordinate part or member of a building or a car, as of a staircase or cornice. See *Deck soffit-board*.

Soil-hopper. Figs. 1090-6. See *Closet-hopper*.

Sole-bar (English). 1, figs. 116, 117, 205, 206. American equivalent, *outside sill*. One of two longitudinal bars which are the main members of the *underframe*, which see. In English car-construction the outside sills are relatively more important than in America, as will be seen in figs. 116-119.

Sole-bar angle-iron (English). 12, fig. 304. An angle-iron secured to the *sole-bar*, to stiffen it. A plate is sometimes used instead of an angle-iron.

Solid-braided bell-cord. Figs. 709-10. See *Bell-cord*.

Solid-head coupling-pin. Figs. 436-443. So called in distinction from an *eye-head* pin.

Solid-head drawbar. Fig. 452. A wrought-iron drawbar having the head and shank in one solid forging instead of being united by riveting, as in figs. 449-51.

Solid-leather nails. Figs. 10454, 1230. A form of ornamental nail for finishing work, in which the head is of solid leather, the mode of attaching the metal pin to the same having been patented Oct. 18, 1881. The same principle is applied to the manufacture of *solid-leather buttons*, also much used for decorative purposes.

Solid-nipple seat-arm. Figs. 1169-74. A device for giving a larger bearing surface and more solid connection to the seat-arms. Patented by W. G. Creamer, and now almost universally used in principle even when the exact features of the patent are not followed.

Solid wrought-iron single-spoke wheel (English). 25, figs. 116-119. A wheel in which the spokes, hub (*boss*) and rim are all welded together, each spoke consisting of one single bar. The tire is shrunk on.

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Spear's draft regulator. Figs. 1491-2. A device by which an air inlet is opened in the smoke-pipe in such manner that the draft is checked but no gas is permitted to escape, the current being entirely inward.

Spider. See *Centre brake-lever spider*. *Tank waste-cock spider*.

Spider-plate, or underframe plate (English). 16, figs. 116-119 and 204-207. A flat horizontal wrought-iron bar connecting two or more timbers of the *underframe* together, and being placed beneath them prevents one sinking below the others. It is often made with three or more arms radiating from a common centre ; hence its name. The form shown is a plainer form.

Spindle. Fig. 999 ; B, figs. 1003-4, etc. See *Door-latch spindle*.

Spindle, or bolt drawbar. Fig. 449. See *Drawbar*.

Spiral-elliptic seat-spring. Fig. 1226. A spring made of a thin band of steel wound in a spiral coil, the transverse section of which is elliptical.

Spiral sash-spring. Fig. 1650. See *Sash-spring*.

Spiral seat-spring. Figs. 1227-9. The common form of seat-spring, which see.

Spiral spring. Figs. 2049-94. (Graduated spiral springs,

to nest-springs made from bars of such size that the resistance of the coil is proportioned to its diameter. Spiral springs are also designated according to their use as *equalizer-springs*, *journal-springs*, *pedestal-springs*, *bolster springs* (which latter are the main springs of a car), *buffer-springs*, *draw-springs*, etc.

Spiral-spring cap. 4, figs. 2095-6, 2044, 2045, 2095-2106, 2047, 2078-86. A casting or plate which forms a bearing for the top of a spiral spring, and which also holds it in its place. A *nut* is used at the other end, but both these parts in bolster-springs are commonly called *spring-plates*, which see.

Spiral-spring seat. See above.

Spittoon. Fig. 808. A vessel to receive discharges of spittle and other abominations. A *cuspidor*, which see, is the same thing in a different form.

Splash-board. 49, figs. 169-88. A board attached in an inclined position covering up the back of passenger-car steps. It serves much the same purpose as the *risers* of steps, and prevents mud and dirt being thrown on the steps.

Splasher (English). 188, figs. 204-6. An iron plate attached to the floor above the wheels. Only used when the wheels are too large in diameter to clear the ordinary floor. Also called *wheel-cover* or *wheel-plate*.

Splice. 1. "The union of ropes by interweaving the strands."—*Webster*. Hence any appliance by which the ends of a rope, cord, beam or bar, are united. See *Bell-cord splice*.

2. (For car-sills.) See *Scarf-joint*. *Ship-splice*. According to the rules for the interchange of cars of the Master Car-Builders' Association, the splice of a sill to be received must be 24 in. long and arranged as shown in fig. 651.

Split-key. 17, 18, figs. 833-5, etc. A form of pin which is self-fastening, consisting essentially of two parallel trips or bars of metal which when united constitute one pin, but which tend to spring apart, so that the pin cannot be withdrawn without the use of considerable force.

Split-ring (for lamp). Fig. 830. An adjustable ring to carry a lamp-shade, permitting of a variation of diameter. See *Lamp-shade*.

Spoke. "One of the radial arms which connect the hub with the rim of a wheel."—*Knight*.

Spoke-wheel. Figs. 2126-65. A wheel the rim or tire of which is connected with the hub by spokes instead of

one or more plates. These spokes are sometimes made of solid cast-iron, in others they are cast hollow, and in still others are made of wrought-iron. See *Hollow-spoke wheel*, figs. 2127-9. *Hand-car wheel*, figs. 1724-6. *Wrought-iron* (Kirtley's double-spoke) *wheel*, figs. 2163-5.

Spool (of hoisting-gear). 41, figs. 1821-4. The drums on which the hoisting-rope or chain is wound.

Spool-shaped spiral-spring. Fig. 2051. This form was patented by W. P. Hansell in 1874-5. Its object is to obtain a *graduated spring*, which see.

Spring. Figs. 2081-2106, etc. (*Elliptic springs*, figs. 2031-2341; *rubber*, etc., *spring*s, figs. 2048-8; *spiral spring*s, figs. 2049-2094; and *spiral graduated spring*s, figs. 2095-2106). An elastic body to resist concussion. Springs are also used to produce motion in a reverse direction to that caused by some other applied force, as a brake-spring and the spring of a door latch. The leading forms of springs are *elliptic springs* and *spiral springs*, which see. Modifications are the *spiral-elliptic* and the *half-elliptic springs*. *Volute* and *india-rubber*, or *gum* springs are little used. Spiral springs are designated according to the number combined together one within the other, as *double-coil*, *triple-coil*, etc., or if the springs are placed side by side, as *two-group*, *four-group*, *six-group*, etc.; elliptic springs, according to the number united to work together as one spring, are designated as *double* or *duplicate*, *triple* or *triplicate*, *quadruple*, *quintuple*, and *sextuple*. The main springs about a car are nearly all spiral springs, except that elliptic springs are almost exclusively used for the bolster-springs of passenger cars. The minor springs, designated in name by the purpose which they serve, are the following, which see:

<i>Back-spring.</i>	<i>Lateral-motion spring.</i>
<i>Berth-spring.</i>	<i>Mirror-frame spring.</i>
<i>Brake-loose coupling-valve spring.</i>	<i>Release-spring.</i>
<i>Candle-spring.</i>	<i>Safety-grate spring.</i>
<i>Coupling-spring.</i>	<i>Sash spring.</i>
<i>Double release-spring.</i>	<i>Sash-lock spring.</i>
<i>Double sash-spring.</i>	<i>Seat-latch spring.</i>
<i>Door-latch spring.</i>	<i>Seat-lock spring.</i>
<i>Door-lock-latch spring.</i>	<i>Sash-spring.</i>
<i>Door-spring.</i>	<i>Spiral seat spring.</i>
<i>Graduating spring.</i>	<i>Spiral sash-spring.</i>
<i>Journal-box-cover-spring.</i>	<i>Swing-bolster spring.</i>
	<i>Window-blind spring.</i>

The principal springs of a car supporting its weight are the *bolster-springs*, also called *bearing-springs* or *body-*

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are not arranged so as to be fastened with a key. See *Latch*.

Spring door-lock. Fig. 995. A lock usually called a *night-latch*. See *Latch*.

Spring door-stop. Figs. 768-71. See *Door-stop*.

Spring draw-clevis (street cars). One which can slide longitudinally, and whose movement is resisted by a spring.

Spring draw-hook (street cars). One which can slide longitudinally, and whose movement is resisted by a spring, so as to give it elasticity when subjected to tension.

Spring-edge (car upholstery). Figs. 1205-8-12-13. A term applied to a method of upholstery which protects the frame-work entirely by springs, so that it is not felt by the occupant of the seat.

Spring end-sill. A long bar of some tough, elastic wood used in certain narrow-gauge and other cheap cars as a substitute for a draw-spring. It is bolted to the end-sills at its ends only, and having a cast-iron draw-head bolted to its middle. The natural spring of the wood then becomes a partial and cheaper substitute for a draw-spring.

being vertical, it cannot put initial tension on the spring.

Spring-lock. 1. (For feed-door, Kohler stove.) G, fig. 1474.

2. (Bissell stove.) Figs. 1874, 1896.

Spring-lock handle (Bissell stove). Figs. 1876, 1888.

Spring-padlock. Figs. 1029-37. A padlock, the hasp of which can be locked by pressure only, without a key; so called in distinction from a *dead* padlock.

Spring-pin. 41, figs. 1955-78. See *Lateral-motion spring-pin* (passenger-car trucks).

Spring-pivot (deck-sash, which see). Fig. 1642.

Spring-plank. 43, figs. 1907-69. A transverse timber underneath a truck-bolster and on which the bolster-springs rest. Also called *sand-plank* or *sand-board*. A *spring-plank safety-strap* or guard, which see, passes under the spring-plank. In iron trucks, iron *spring-plank bars* take the place of the wooden spring-plank, as S, figs. 1971-3. Large spring-planks are sometimes *framed*, and so called, as fig. 2029. A *swing spring-plank* is used in passenger and other *swing-motion* (which see) trucks. In rigid-bolster trucks the spring-plank is bolted to the lower arch-bar of the truck-frame. Some exceptional trucks, as figs. 1942-4, 1948-50, have no spring-plank nor bolster-springs.

Spring-plank bars (iron 6-wheel truck). S, figs. 1971-1973. See above.

Spring-plank bearing. 44, figs. 1912-66. A casting on which a spring-plank rests, and which is supported by the lower swing-hanger pivot. Also called *cross-bar casting* or *spring-plank carrier*, figs. 2110-11.

Spring-plank carrier, or cross-bar casting (swing link-hanger). 3, figs. 2110-1. See above.

Spring-plank safety-strap (passenger-car trucks). 45, figs. 1955-67. A U-shaped strip of iron attached to the transoms, and passing under the spring-plank, so as to hold it up in case the swing-hangers or their attachments should break.

Spring-plank timber (framed spring-plank). Fig. 2029. A timber forming one of the sides.

Spring-plate. Figs. 2094, 2096-7, etc. A common term for *spring-seats* and *caps*, especially those of considerable size, as for bolster-springs. They are often provided with *spring-plate lugs* to hold the spring in place.

Spring-plate lugs (bolster-spring). 5, figs. 2095-6. See above.

Spring-pocket (strap drawbar). 1, fig. 450. See below.

Spring-pocket, or strap, drawbar. Figs. 387-9, 450-3. A drawbar with a rectangular strap or "pocket" at the back end in which the draw-spring is placed. So called in distinction from a *bolt* or *spindle drawbar*.

Spring-saddle. 1. (Iron passenger-car trucks.) 103, fig. 1959. A \cap -shaped bar of wrought-iron, which is placed on top of a journal-box surrounding the arch bar and on which a spring rests.

2. (Street cars.) 7, fig. 1843. A similar part having projecting ledges (*spring-shelf*) on each side, on which the springs rest.

Spring-sash-holder. Fig. 1651. A little-used device for holding up sashes.

Spring-seat. Figs. 2067-2106. A cup-shaped piece of cast or wrought iron on which the bottom of a spring rests. See *Spring-cap*. *Spring-plate*.

They are further distinguished by the name of the spring for which they serve, as *bolster-spring seat*, *equalizer-spring seat*, etc.

Spring-shackle (English). See *Spring-link*.

Spring-shelf. See *Spring-saddle*.

Spring-stud (street cars). A round iron bar which rests on the top of the journal-box or spring-seat and passes through the centre of a spiral or rubber spring. The upper end works in a guide and thus holds the spring in its place. A similar bar has been used on steam-cars for transmitting the weight from the spring to the journal-box.

Spring-toggle driver-brake. One of the four styles of driving-wheel brake-gear manufactured by the American Brake Co. It differs from the general plan of the *bell-crank driver-brake*, figs. 383-5, chiefly in the interposition of a spiral spring between the brake-shoe and the toggle-joint by which the power is applied, in order to equalize the pressure.

Spring-yoke. A *spring-saddle*, which see.

Sprue (foundry). The piece of metal which fills the *gate* or channel through which the metal is poured in making a casting. This piece is broken off when the casting is cooled. The gate itself is often called a *sprue*.

Sprue-hole. A *gate* of a mould for casting metals.

Spur-wheel (hoisting-gear, etc.). 9, figs. 77-8; G, fig. 145.

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Stake-pocket U-bolt. 2, fig. 652, etc. See above.

Stake-rest (flat cars). 2, fig. 14. A bracket or support on which a stake rests when turned down horizontally.

Stake-sleeve (flat or gondola cars). 2, fig. 653. A casting with a horn-shaped projection slipped over a stake to hold up the hinged side of a platform or gondola car.

Stanchion. 1. A prop or support.

2. (Nautical.) A term very generally but not exclusively used, for posts with an eye in one end which carries a rope.

3. (Car and locomotive work.) Fig. 1040; 3, fig. 382, etc. By analogy from nautical use, a metal post or hanger with an eye in one end, which holds a rod or other object, as a hand-rail or curtain-rod. The opposite end is usually fastened by a nut, or with a flange or lugs which form a part of the stanchion. Also see *Window-curtain-rod stanchion*, fig. 1693.

Stand. "Something on which a thing rests or is laid."—*Webster*.

See *Radiator-stand*.

Seat-stand.

10 lbs. The shoe is held in position at the bottom by a *split-key*.

Standard car-axle (M. C. B.). Figs. 1874-5.

Standard cast-iron drawbars. Figs. 453-538. A collection of drawbars which are carried in stock for repairing purposes on the New York, Lake Erie & Western Railroad, in all probably including from one-fourth to one-fifth of the important existing variations.

Standard dead-blocks and height of drawbar (M. C. B.). Figs. 405-8.

Standard distance-gauge between backs of flanges (M. C. B.). Fig. 1996.

Standard draw-gear attachments (M. C. B.). Figs. 401-404.

Standard gauge. The most common distance between the rails of railroads, which is throughout the world 4 ft. 8½ in. See *Gauge*. This gauge originated from the use of an even 5 ft. gauge with *outside flanges*. As inside flanges came to be preferred, and had to run on the same rails (then with much narrower heads than now) the present standard was of necessity used.

Standard journal-bearing and key (M. C. B.). Figs. 1984-92.

Standard journal-box (M. C. B.). Figs. 1997-2001.

Standard ladder and grab-iron attachments (M. C. B.). Figs. 656-7.

Standard lamp-chimneys. Figs. 926-88. See table of standard dimensions under *lamp-chimneys*.

Standard lamp-shades. Figs. 942-8. See *Lamp-shade*.

Standard lettering for line cars (M. C. B.). Figs. 658-9.

Standard limit-gauge for round iron (M. C. B.). Figs. 1835-6.

Standard pedestal (M. C. B.). Figs. 2021-4.

Standard screw-threads (M. C. B.). Fig. 1829. See also *Sellers and Whitworth*.

Standard splice (M. C. B.). Fig. 651. This is practically but not formally one of the M. C. B. standards. See *Interchange of traffic*.

Standard wheel and axle gauges (M. C. B.). Figs. 2114-2128.

Standing, intermediate or partition pillar (English). 95, figs. 204-207. American equivalent, *post*. An upright piece in the body running its entire height. The term is not applied to the *corner* or *doorway pillars*, which see.

Staple. A U-shaped piece of wrought-iron pointed at the ends, to be driven into wood to hold a hasp, hook, pin, etc.

Stationary-lock (freight cars). Figs. 1014, 1017, etc. A lock permanently fixed to the door or side of the car, in distinction from padlocks, which are as yet the most commonly used.

Stay. A beam, bar, rod, etc., by which two or more objects are connected together to prevent lateral deviation of one or both of them.

See *Body querr-post stay*.
Centre-stay.

Lamp-stay.
Pipe-stay.

Sill-step stay.

Stay-rod. A rod which acts as a stay. See *Pedestal stay-rod*, 7, figs. 955-73.

2. (Of a derrick or crane.) 7, figs. 77-78; J, fig. 145; D., figs. 151-3. See *Tension-rods*.

Steam brake-valve (American Brake Co.). Figs. 860-3. A part corresponding to the *engineer's brake-valve* of the Westinghouse brake, by which the admission of steam to the brake-gear is controlled.

Steam-car. A term used to designate ordinary railroad cars when it is desired to distinguish them from *street cars*.

Steam-cylinder (Westinghouse brake). 3, figs. 298-9; figs. 294, etc. The admission of steam to this cylinder is controlled by the *reversing-piston* and *reversing-valve*, which operate the *main steam-valves*. See *Cylinder*.

Steam-cylinder gasket (upper and lower, of Westinghouse air-pump, etc.). 36 and 37, fig. 299, and 40-1, fig. 299. See *Gasket*.

Steam-cylinder head (Westinghouse brake). 2, figs. 298-9. A cover for the top of the steam-cylinder.

Steam-pipe. 1. (Engine of Westinghouse brake.) 6, fig. 298; 14 and 35, figs. 298-9. The steam supply-pipe to the steam-cylinder.

2. (Westinghouse pump-governor.) A, fig. 316.

Steam-pipe swivel (Westinghouse pump-governor). 11, fig. 316.

Steam-pipe union (Westinghouse air-pump, etc.). 14, fig. 298. A *pipe-coupling*, which is often called a *union*.

Steam-piston (engine of Westinghouse brake). 10, fig. 298; 7, fig. 299. See *Piston*.

Steam-piston packing ring (Westinghouse air-pump) 12, fig. 298; 9, fig. 299. See *Piston*.

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senger-car steps, figs. 686, etc., are from their locality called *platform-steps*, or from their material *box-steps*. On street cars only a single step is used, called the *side-step*. See also (street cars) *enclosed-step*, *longitudinal-step* or (English) *foot-board*. In freight cars a U-shaped iron called the *sill-step*, which see, figs. 656-7, is used (M. C. B. standard dimension, $\frac{1}{4}$ by $1\frac{1}{4}$ in. iron), and a kind of platform on the roof, called the *roof-step*. A small ledge on the end of a freight car near the top for a brakeman to stand on when applying brakes called the *brake-step*, is also used, but has been condemned by vote of the Master Car-Builders' Association. A bracket called a *tank-step* is attached to the tanks of tank-cars. Steps in stairs are connected by vertical *risers*.

Step hand-rail (street cars). 2, figs. 1840. See *Hand-rail*.

Step-hanger. 48, figs. 155-85. A vertical wrought-iron bar by which the steps are supported from the corner of a car and from the platform-limber.

Step-iron (platform steps). 47, figs. 155-85. A flat iron bar bent to conform to the shape of the steps and their risers and to which they are fastened. It is bolted at the upper end to the platform-sill.

2 (English). 173, figs. 205-7. Also called *lean-iron*.

iron, 9, figs. 383-400, is sometimes called a *stirrup*, as below.

2. (Cowell platform and coupler.) 9, fig. 540. A stirrup-shaped iron, sometimes called a carry-iron, which supports the drawbar in place. It is cast with a pocket for inclosing the *drawbar side-spring*, 17, which latter gives the coupler the necessary lateral motion. It takes the place of the *Miller leaf-spring* or *coupling-spring*.

3. (Janney coupler.) 103, figs. 542-58. A drawbar carry-iron.

4. (Janney-Miller coupler.) 51, figs. 554, 555-601.

Stirrup-block (Miller platform). 30, figs. 636-7. A block attached to one of the centre-sills next to the platform end-timber, to receive the bolts which hold the *drawbar carry-iron*.

Stitched roll (upholstery). The finish for seams of car-seats. *Felt-edge*, which see, fig. 1235, is used as a substitute.

Stock car. Figs. 5-9, 33-4, 132-8. A car made for transporting live stock, usually having a tight roof, but open grating sides and ends. Certain little used varieties called *box stock-cars*, figs. 8-9, have only large grated ventilators. *Double-deck* stock cars are built for the carrying of sheep and hogs, and nearly all modern stock cars are so designed that they can be used as double-deck cars if desired. In order to prevent suffering and injury to stock when carried in the common form of stock cars, various designs known as *palace stock-cars* (which see, for list) have been designed and to some extent used, but none of these are as yet in general use.

Stop (Janney-Miller coupler). 43, figs. 554, 555-601. The guard used to prevent the Miller hook from uncoupling by reason of lateral motion of cars.

2. (Miller coupler.) 13, figs. 636, 638-40. A casting attached to the platform end-timbers of a car to limit the lateral movement of the hook on the adjoining car.

3. Anything which prevents or limits movement; usually called by the name of the object which it stops, as the following, which see.

Berth-stop.
Brake-lever stop.
Blind-stop.
Centre-stop.
Closed-door stop.
Deck-sash stop.
Door-stop.

Outside window-stop.
Partition-stop.
Sash-lock lower-stop.
Sash-lock stop.
Sash-lock upper-stop.
Sash-stop.
Seat-arm stop.

Drawbar stop.
Draw-spring stop.
Floor-stop.
Inside window-stop.
Open-door stop.

Seat-stop.
Side-stop.
Spring-door stop.
Ventilator-stop.
Window-blind stop.

Stop-bar (emigrant sleeping-car). Fig. 685. A bar to connect the two seats on which the seat-bottoms may rest when drawn down to make up into beds. It rests upon a *stop-bar plate*, fig. 1294.

Stop-bar guide. Fig. 1296. An attachment to hold a *stop-bar* in place laterally.

Stop-bar hinge. A, figs. 682-5. The hinge which enables the *stop-bar* to swing horizontally.

Stop-bar plate. Figs. 682-5, 1294. See *Stop-bar*.

Stop-bead, or parting-strip. 16, figs. 692-694. More properly *sash parting-strip*. The strip dividing the groove for the window-sash and the groove for the blind.

Stop-bolt (of car-door lock). G, fig. 1006. An attachment for throwing a door-latch out of gear.

Stop-brace (Miller coupler). 14, figs. 636-40. An iron bar attached to the draw-timbers and to the lower end of a *stop* as a brace for the latter.

Stop-cock (for brake-pipe of Westinghouse brake). 16, fig. 311; fig. 298; 25, fig. 335. A faucet attached to the brake-pipe of a Westinghouse automatic brake so that the pipe can be closed if the brake-hose are to be uncoupled. If the compressed air were allowed to escape from the brake-pipe, the brakes would be applied.

Stop journal-bearing. Fig. 2004. One with a lug or projection which bears against the end of the axle to restrain lateral motion and thus dispense with a collar.

Stop-key. See below and *journal-bearing stop-key*.

Stop-key journal-bearing. Figs. 2006-9. Similar to a *stop journal-bearing*, except that the stop is carried on the journal-bearing key or wedge.

Stop-latch. Figs. 995-1010. A spring door-latch with a *stop-bolt* by which the latch can be fastened on one side so as not to act. Also see *Saloon stop-latch*.

Stop-pin (American automatic compression brake). 29, figs. 368-9. The pins passing through the *governor-blocks*, by which the latter act upon the *disk*.

Stop-plate (for journal-box). 3, figs. 2005, 2006-9. A metal plate which forms an end-bearing for the axle and checks its end-motion. It is held in position either by flanges cast in the box, or by attaching it to the journal-

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larly applied to the original form of the Westinghouse air-brake. It is used only in combination with the automatic air-brake and only for descending heavy gradients where it is necessary to re-charge the reservoirs, which is difficult with the automatic form. The *double-check valve*, which see, was used to enable either system to be used, but since the introduction of the *pressure-retaining valve*, fig. 317, which retains sufficient pressure to enable the train to be re-charged, the use of "straight-air" is passing away, since there is no longer danger of the train getting beyond control while re-charging the auxiliary reservoirs to make up for the loss of air in releasing the brakes.

Straight closet hopper. Fig. 1093.

Straight-tank (tank car). One with the rings or plates of metal placed alternately inside and outside of each other, as in fig. 139, in distinction from *telescope tanks*, which see.

Strainer (Westinghouse brake air-pump). Figs. 294, etc.
See *Air-strainer*.

Straining-rod. See *Brace straining-rod*.

Strap. A long narrow strip of leather, cloth or metal.

Strap drawbar. Figs. 450, etc. A *spring-pocket drawbar*, which see.

Strap-hanger. Figs. 784-7, etc. See *Bell-cord hanger*.

Strap-hinge. 1. Fig. 788. A door-hinge, the two parts of which are made longer than those of a butt-hinge, and of a triangular shape.

2. (Engl.-h.) 71, figs. 116-119. In a freight car (*goods wagon*) a hinge in which the pin is welded to two flat bars at each end, and the main part of the hinge is turned while hot over the pin. The hinge has thus no loose part. The main part or strap is secured to the door, which it stiffens. The flat ends of the pin are bolted to the car. See *Hinge-plate*, 72, figs. 116-119. The main part of a strap hinge.

Strap-sheave (postal cars). Fig. 1078.

Strap-washer, or *washer plate*. 78, figs. 116-9. A wrought-iron strap which takes the heads of several bolts.

Street car. Figs. 1835-64. A light car, usually with four wheels, constructed for carrying passengers on street railways and generally drawn by horses; hence often called *horse-cars*. A common form of street car is the *two-horse-car* with two platforms, fig. 1837, but often much longer than shown. *Summer* street cars with the seats facing, fig. 1841, are very largely used, and are generally at least one section longer than the engraving. The *reversible seat* open street car is passing out of use. *One-horse* street cars, figs. 1836 and 1940, are largely used for subordinate lines and less frequently *reversible* street cars, fig. 1842. *Double-deck* or *top-seat* street cars are very rarely used in this country, although common in Europe.

The first street railway in the world was the New York & Harlem, incorporated in 1881. The first cars were run November, 1882, from Prince Street to Harlem Bridge, the cars being in the form of three stage bodies carried on a single set of wheels, with side doors only, but with a perch at each end for the driver. The next street railway completed was the Sixth Avenue of New York, in 1852. Immediate and rapid growth there and elsewhere followed, and by the year 1858 street cars were in use in all the large cities in the United States. A line in Paris was introduced in 1853, one in Cape Town, South Africa, in 1859, and one in Birkenhead, opposite Liverpool, in 1862.

Street-car brake (Tyler). Fig. 229. See *Tyler brake*.

Other styles are used, but the Tyler is most common.

Street-car centre-lamp. Figs. 883, 844, etc.

Street-car pedestal-springs. Figs. 2069-90.

Street-car side-seats. Fig. 1217.

Street-car wheel. Figs. 2187-43. A light cast-iron, *single-plate* or *open-plate* wheel.

Strike-plate. Figs. 1242, 1254, 1277, 1637, etc. The keeper for a *beveled* latch-bolt against which it strikes, so as to snap shut automatically. See *Keeper*, which is a general term including and often used as a substitute for strike plate.

Striker-arm. Figs. 1112-3, 1170-1, etc. A *seat-arm*, which see. The terms *striker-arm* and *seat-arm* are both used in the trade.

Striker-plate. See *Strike-plate*.

String-board (passenger-car steps). 7, fig. 686. A vertical board which supports the ends of the steps.

Stringer. (Carpentry.) "A horizontal timber connecting posts in a frame, as a tie-timber of a truss-bridge; a horizontal tie in a floor-framing."—*Knight*.

2. (Bridge construction.) The principal longitudinal timbers at the base of the roadway or track structure, analogous to the sills of cars. Hence, this name is often given to the sills of a car, as in figs. 1802, 1811, 1814.

8. (Pile-driver cars.) 6, figs. 1821-4. The *top-stringers*, which see.

Stringer sway-brace (pile-driver car). 4, figs. 1821-4. Or *sway-bracing* for the top-stringers.

Strip.

See *Diagonal roof strip*.

Lining-strip.

Panel-strip.

Parting-strip.

Roof-strip.

Sash-parting strip.

Strut (of a truss). 8, 9, figs. 2182-6. A member subjected to a strain of compression. A vertical strut is usually called a *post*.

Stud. 1 (Carpentry.) "A small piece of timber or joist inserted in the sills and beams between the posts to support the beams or other main timbers. The boards on the outside and the laths on the inside of a building are also nailed to the studs."—*Webster*. A vertical *scantling*, which see.

2. (C-r construction.) 60, figs. 155-78; 16, fig. 1848. A short vertical wooden post between the window-posts

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Sun lamp-chimney. Fig. 930. See *Sun-burner and lamp-chimney*.

Supply-pipe. 1. ("American" horizontal-cylinder steam driver-brake.) 19, figs. 353-9. The steam supply-pipe to the brake-cylinder.

2. (Air-pump, Westinghouse brake.) 8, figs. 295-7, 294, etc. A pipe through which the air enters the air-pump. More commonly called *air-inlet*.

3. (Suspended heater.) D, figs. 1529-33. The inlet for cold air.

Supply-valve (of reducing-valve, West. train-signal apparatus, which see). 5, fig. 691.

Support. "That which upholds, sustains, or keeps from falling, as a prop, a pillar, a foundation of any kind."—*Webster*. See *Cylinder-lever support*. *Drummond support*. *Pipe support*.

Susemihl & Miller grain-door. Figs. 373-6. A grain-door which is moved in and out of place by swinging it upon a pivoted *guide-bar* 2 working upon a *segment* or *quadrant* 3. The guide-bar is fixed at one end to the *guide-bar pivot* and attached at the other to the grain-door by the *guide-bar plate* 5. When out of use the door

Suspending-stud. 25, figs. 822-3. See *Brake-block suspending-stud*.

Sway-brace. 4, figs. 1821-4. A term borrowed from the similar parts used in trestles to designate any form of diagonal bracing, but more especially timber planking spiked on the main timbers of a structure. See *Stringer sway-brace*.

Sweeping-car, or sweeper. Fig. 70. A car with rotary brooms for sweeping snow from a railroad track. The brooms are attached to a horizontal shaft which is connected by suitable gearing with the axles, and the brooms are thus made to revolve. Used only in cities.

Swing-barrel truck. Fig. 1904. A form of *freight truck*, which see, for rapidly loading barrels, having a bail to throw over the head of the barrel for holding it in place.

Swing-beam. See *Swing-bolster*. *Swing spring-plank*.

Swing-bolster. 30, figs. 1912-69. A truck-bolster (so called in distinction from a *rigid-bolster*) which bears on springs that are supported by a transverse timber called a *spring-plank*, which is suspended by *hangers* or *links*, so that it can swing laterally to the truck. As the springs rest on this plank and they support the bolster, the latter can swing with the spring-plank. The object of providing this swinging motion to the bolster is to prevent, as much as possible, lateral blows and shocks from being communicated to the car-body, and, *vice versa*, to prevent the momentum of the car-body from acting with its full force on the truck.

Nearly all passenger-car trucks are swing-bolster. In freight trucks practice is about evenly divided. At the Master Car-Builders' Convention, 1884, the vote in favor of adopting the swing-bolster in a standard truck was 32 to 30.

Swing-bolster spring. 40, figs. 1964-7. See *Lateral-motion spring*.

Swing-hangers. 46, figs. 1912-69. Bars or links attached at their upper ends to the transoms of a swing-motion truck, by which the spring-plank is suspended at their lower end so that it can swing laterally. Various forms are (1) solid bars with an eye at each end; (2) *swing link-hangers*, which see, figs. 2110-11, made like a long link of a chain; (3) those made with a fork or clevis at one end and a boss at the other; and (4), figs. 2112-13, those made with a very short link attached to

an eye-bolt passing through the transom. These latter are called *eye-bolt link-hangers*.

Swing-hanger friction-block. 50, figs. 1961-2. A casting, or bearing of considerable diameter, on which the upper end of a swing link-hanger rests. See also below.

Swing-hanger friction-washer (lower and upper, for swing link-hanger). 3 and 7, figs. 2110-11. A cast-iron chafing block serving no other purpose than to take the wear. It is only occasionally used. A *friction block* is almost synonymous, but is usually a larger casting.

Swing-hanger pivot (lower and upper) (passenger-car trucks). 47-8, figs. 1955-78; 2110-11. An iron bar by which a swing-hanger is suspended, or which supports a spring-plank. The lower spring-hanger pivot is more commonly called a *cross-bar* or *mandrel-pin*. The upper one is carried in a *swing-hanger pivot bearing* attached to the transom.

Swing-hanger pivot bearing. 49, figs. 1912-69. See above.

Swing-hanger shaft. A *swing-hanger pivot* or *cross-bar*, which see.

Swinging-platform (pile-driver car). Figs. 1821-4. A platform carrying the entire pile-driving gear in such manner that it can be swung about at right angles to the car so as to project for a considerable distance on either side. It swings upon a *centre-plate* and its movements are controlled by the *slewing-gear*, which see. A *cabin* is almost always built upon it and the floor is constructed with sills and end-sills corresponding to those usually used in a car-floor. Removable *wings*, 20, are sometimes provided to support the swinging-platform when swung out in this manner. See *Pile-driver car*.

Swinging-platform centre-plate (pile-driver car). 46, fig. 1823. See above.

Swinging-platform end-sill (pile-driver car). 18, figs. 1821-4. See above.

Swinging-platform sill (pile-driver car). 18', figs. 1821-4. See above.

Swinging-sash. A window or blind sash which is hung and swings on hinges. See *Door-case sash* (street cars). Otherwise rarely used.

Swing-joint (Cobb's pivoted seat-arm, which see) 3, fig. 1171. More properly *seat back pivot*. A pivot joint in the middle of the seat-back to which the *seat-arm* is

ly attached to

ing-hanger.

s. 2110-11. A
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4-7.

A truck with
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One of the parts connecting the *platform-lever* to the *Miller hook*. It enters on to the *swivel-hook* 62.

Swivel-hook (Janney-Miller coupler). See above.

Swivel turnbuckle. Fig. 1881. One of the commonest forms of turnbuckle, which see. See also *swivel*.

T

T, or Tee (pipe fittings, which see). Figs. 1338, 1343, etc.

A -shaped cast-iron tube for unit ng one pipe at right angles to two others in the same line. The pipes are screwed into the arms of the T. A *reducing-tee*, which see, has the arms of different diam- ters.

Taber burner. A burner similar to the *dual*, figs. 873-4, except that it has two wicks in one tube instead of a separate tube for each wick.

Table (parlor and sleeping car-). 40, fig. 679. A removable board attached to the side of the car by inserting a *table-hook* fixed to the table into a *table-hook plate* fixed to the side of the car. The inner end of the table is supported by a table-leg, which is sometimes vertical and sometimes *slanting*, which see. The tables of *dining-cars*,

visible from the engine. They are often of two or more colors.

2. (English.) A colored signal lamp carried at the rear end of the last vehicle of a train. See also *Side lamp*.

Tai'-pin (of Janney coupler). 18, figs. 542-554, 555-601.

A short wrought-iron pin securing the *draft-bolt* to the *coupler*.

Tangye hydraulic jack. Fig. 1887. One of the more elaborate and complete forms of hydraulic jack, which see. The internal construction of all hydraulic jacks bears a general resemblance to that shown, but is ordinarily less elaborate.

Tank. 1. (Passenger cars.) 1, fig. 1570. A *water tank* for the wash-room.

2. (Pintech gas-lighting apparatus.) H, fig. 813. More properly *recipient*, which see.

3. (Tank car.) 106, figs. 139-42. A boiler-iron receptacle for oil, sometimes made of uniform diameter or *straight*, but generally made *telescopic* by slipping each successive ring inside the other, so as to bevel the tank towards the middle, to afford better drainage. It is held in place by *tank-bands*, fastened to *tank band hooks* on the top of the car to prevent the tank from turning. A *tank-dome* is added at the top and *tank-heads* are used to close the ends. A *tank-nozzle* is used for emptying the oil, closed by a *tank-nozzle cap*, which latter is fastened to the nozzle by a *tank-nozzle cap chain*. The oil is drawn off through the *tank-valve*, which see.

4. (Westinghouse brake.) 1, figs. 295-7. The *main reservoir*.

5. (Winslow heater.) Figs. 1534-6. See *Safety-tank*. See also *Safety water-base* (Bissell heater).

Tank-band. 107, figs. 139-42. See *Tank*.

Tank-band hook. See *Tank*.

Tank car. Figs. 23, 139-42. A car provided with a large *tank*, which see, for carrying oil. They were formerly in very extended use, but have been partially supplanted by the introduction of pipe-lines, of which some thousands of miles are now in use.

Tank-dome. 108, fig. 139-42. See *Tank*.

Tank-head. 106, figs. 139-42. See *Tank*.

Tank-nozzle. 115, figs. 139-42. A short pipe used to empty the *tank*, which see. It is usually cast in one piece with the *tank-valve seat*, which see.

Tank-nozzle cap. 118, figs. 139, 142. See *Tank*.

Tank-nozzle-cap chain. See *Tank*.

Tank-step (tank car). A metal shelf or bracket fastened to the tank to facilitate access to the top of the dome.

Tank-valve. 1. (Tank-car). 114, figs. 139, 142. A valve attached to the bottom of the tank to draw off the contents.

2. (Water-cooler). Figs. 1597-9. A valve used with water tanks which extend to the roof, and sometimes with other smaller fixed tanks, for enabling them to be completely drained when desired. Also called *water-cooler valve*.

Tank-valve cage. 116, figs. 139, 142. A metal inclosure, over the top of a tank-valve, as a guide for it.

Tank-valve rod. 117, figs. 139, 142. A rod for opening and closing a tank-valve extending from the valve to the top of the dome.

Tank-valve seat. 115, figs. 139, 142. A metal plate, with one opening in it, closed by the valve. It is riveted to the underside of the tank and has a *nozzle* attached to it to which pipes are connected for conducting the oil.

Tanner brake. Fig. 233. A device for operating brakes on two trucks at once, which is said to be the invention of Mr. Henry Tanner, and was patented by him in 1853. It consists of a lever 9, having a fixed fulcrum in its centre attached to the body of the car. The ends of this lever are connected by rods and chains 4, 4, with the brake-shafts at the two ends of the car; and at points intermediate between the ends and the fulcrum, the lever is connected by rods 6, 6, with the brake levers 2, 2. The centre-lever 9 can thus be operated and the brakes be applied to both trucks by the brake-shaft and wheel at either end of the car. A difficulty with this form of brake is, that unless the adjustment of the connecting-rods and brake-shoes is perfect, the pressure of the brakes will not be alike on the two trucks.

Target-lamp (operator's). Fig. 971. A *signal-lamp*, which see, used for attaching to fixed targets or semaphore signals. No special form of signal-lamp is required or used for this purpose except that they are powerful and well-constructed lamps.

Tarpaulin, or wagon-sheet (English). A piece of stout, flexible waterproof painted canvas, measuring about 20 × 12 ft., used to protect the contents of open freight cars (wagons) from the weather. Cords fastened to its edges are tied to *sheet-rings* (which see), by which it is

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readily adjustable distance apart. They are caused to engage by simply pressing on the handles.

Telescopic tank (tank cars). See *Tank*.

Tender-brake. 1. (American Brake Co.) Fig. 366-7. See *steam tender-brake*.

2. (Westinghouse brake). Figs. 295-7. See *Westinghouse brake*. The Westinghouse tender brake-gear does not differ essentially from that used under cars, except that the brake-cylinder has a *piston-sleeve*, which see, which has now been dispensed with in the car-gear.

Tender-buffer (Janney coupler). 75 and 76, fig. 602-35.

The buffer used on locomotive tenders so as to meet the buffers on passenger cars equipped with the Janney coupler. They are made both *flat-face* and *round-face*. Similar attachments for the Miller coupler have recently been introduced, but a mere loose link is much used.

Tender coupler (Janney coupler). 74, figs. 602-35. The appliance for coupling locomotive tenders to cars equipped with Janney couplers. See above.

Tender-coupler catch-spring (Janney coupler). 72, figs. 602-35. See *Catch-spring*.

Tender-cylinder (Westinghouse brake). Figs. 307, 350. See *Brake-cylinder*.

Tender-cylinder (Westinghouse brake). 307, 350.

145; D₁, figs. 151-3. A horizontal stay connecting the top of the *mast* and *boom*. It is of fixed length in a crane and of adjustable length in a *derrick*. See *Derrick*.

Tension-rod clevis (of a derrick or crane). L₁, figs. 151-3. A clevis, which see, sometimes carried at the upper end of the *boom* to which the *tension-rod* connecting the boom and mast is attached.

Test bar (for limit gauges). Fig. 1825. A bar for testing the correctness of *limit-gauges*, which see.

T-hanger. See *Spring-hanger*.

Thatcher corrugated wheel. Figs. 2144-45. A *single-plate* wheel in which the use of *brackets* to stiffen the plate is dispensed with, by making the entire plate of a corrugated form.

Theatre-seats (dining cars). Figs. 198, 214. An ordinary double car-seat having two separate seat-bottoms which can be raised up into a vertical position in the manner usual in theatres, in order to make the inner seats more easy of access. All modern dining cars have these seats.

Thermometer (passenger cars). Fig. 1047. A somewhat elaborate form of the familiar instrument for measuring temperature. It is usually conspicuous by its absence.

Thielsen truck. Figs. 1987-40, 1821-4, etc. An all iron freight-car truck invented by Mr. H. Thielsen, now of Portland, Oregon, having rolled iron *channel-bar* transoms riveted to a *transom-casting* at each end. It is in wide and general use and several modified types exist, as figs. 1915-20, and a number of others not shown by drawings. The essential feature upon which the patent is claimed is in the riveting of the arch-bars and channel-bar transoms to the transom casting.

Thimble. 1. A bushing.

2. A sleeve or tube through which a bolt passes, and which may act as a distance-piece. A thimble is usually round, but sometimes square, as *smoke-pipe thimble*, fig. 1426.

See *Axle-safety bearing thimble*. *Body-bolster thimble*. *Brake-shaft thimble*.

3. (Janney coupler.) 37, figs. 555-601. A small casting in which the point of the catch-lever rests.

4. (Wilson's flexible car-window blind.) D, fig. 1646. A closely-wound bit of spiral wire, serving as a distance-piece for the slats.

T-hinge. Fig. 784. A door-hinge, one part of which is

made like a *strap-hinge*, and the other like a *butt-hinge*, so that the shape of the whole resembles a letter T.

Third-class carriage (English). A car which performs much the same functions as an American so-called "first-class" passenger car, since it carries 88 per cent. of the passengers, but very dissimilar in arrangement, weight and size. It generally weighs about 20,000 lbs. and is carried on four or six wheels, divided into five compartments, and seats fifty passengers. The seats and backs are comfortably shaped and upholstered in rep, stuffed with horsehair. Sofa springs and carpets are generally omitted, but parcel-nets and blinds are generally provided. The comfort of this class of carriage has been very much improved of late years, and in respect to the seats is perhaps superior to that of ordinary American cars. The interior finish is considerably inferior, the interior being generally painted and grained.

Thomas' steel-tired wheel. Figs. 2174-76. A wheel invented by Theodore Thomas, President of the Jersey City Wheel Foundry & Machine Works, the essential feature of which is the use of wooden *cushioning-blocks* inserted in *cushioning-pockets* in the *wheel-centre* so that the tire bears entirely upon these compressed blocks. The tire has an *internal-flange* by which it is bolted to the wheel-centre through the *radial-arms*. The wooden cushioning blocks are forced into the cushioning pockets under pressure.

Thread. See *Screw-thread*.

Three-group graduated bolster-spring. Fig. 2105. See *Graduated Spring*. *Spiral spring*.

Three-group spiral spring. Figs. 2078-5. See *Spiral spring*.

Three-link drawbar. Figs. 383-6, 451, 467. A *Potter* drawbar, which see.

Three-way cock (Westinghouse brake). Figs. 318-9. A cock formerly carried on the locomotive for applying and releasing the brakes. It has been supplanted by the *engineer's brake-valve*, figs. 334, etc., which see.

Three-way joint (Coolbaugh's lamp-holder). Figs. 967-968. A kind of knuckle-joint admitting of motion in any one of three directions.

Three-wheeled hand-car. Figs. 1712, 1714. A light hand-car with two wheels on one rail, somewhat like a velocipede, and a third wheel on the opposite rail merely to steady the vehicle. They are worked either with

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See *Flange*.
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hutting it off

-118. Nearest
A bolt passing
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-8. The catch
d-rest is con-

rm applied to
oving springs,
s.
ing flat-sided

timber distance-blocks and *sill tie-rod*, with wooden
sills.

Tie-rod. A rod which acts as a tie.

See *Body-counterbrace tie-rod*. *Girth tie-rod*.
Brake-block tie-rod. *Lever-frame tie-rod*.
Cylinder-lever tie-rod. *Platform tie-rod*.
End-brace tie-rod. *Safety-beam tie-rod*.
End-girth tie-rod. *Sill tie-rod*.
Wheel-piece tie-rod.

Tie-timber. See *Cross-frame tie-timber*.

Tiffany refrigerator car. Figs. 11-12, 130a. An ice and
salt car belonging to the class of cars having the ice-supply
on the roof. The *ice-pan* is V-shaped, and the *ice-pan*
gutter carries off the drainage-water through a *conduc-*
tor-tube of 3 $\frac{1}{4}$ -in. galvanized-iron pipe leading to a *drip-*
pan under the car. Insulation is effected by dividing
the sides by two intermediate partitions of half-inch
boards into three spaces, of which two are air-tight, and
one, the outer, ventilated. Four thicknesses of felt,
lapped at the joints and fastened by tin tacks, are also
used. The cars were formerly built 28 ft. in length (inside
measurement). The more recent cars are built 30 ft.
long, inside. Their weight is about 25,000 lbs.; ice capao-
ity, 4,000 lbs. See *Refrigerator-car*.

a rod. More commonly called *acorn*. See *Basket-rack tip*. *Berth curtain-rod tip*.

Tip car. Figs. 24-5, 39-40, 143. A car so constructed that its body can be tipped so as to allow its contents to slide out. Often also called *dump-car*. They are sometimes *eight-wheeled* but usually *four-wheeled*. A style of eight-wheeled tip car has been introduced to some extent, which is slowly tipped by gearing, known as the *Van Wormer car*.

Tip-car door. 154, fig. 143.

Tire. 5, figs. 2148-9, 2177-80, etc. A heavy hoop or band of iron or (usually) steel forming the ring or periphery of a wheel to impart strength to it and to resist wear. In this country car-wheels are generally *cast*, but within a few years steel-tired wheels have come into general use for passenger service. They have been practically universal in European practice, and multitudes of devices for fastening them securely to the wheel have been devised. See *Tire-fastening*. The usual dimensions for tires are $5\frac{1}{2}$ to $5\frac{1}{4}$ ins. extreme width by $2\frac{1}{4}$ to 3 in. thick.

In England the word is usually spelt *tyre*. The name is supposed to come from the fact that iron bands were first used on wheels in the city of Tyre, Syria.

Tire-bolt. 2, figs. 2148-9, 2177-80, etc. A screw-bolt for holding a tire on a wheel-centre. When *retaining-rings* are used the bolts pass through the rings and hold them and the centre and tire together.

Tire-fastening. 30, fig. 116 and figs. 2151 to fig. 2158 show the principal English methods. Other modes are shown on figs. 2160, 2163-64, 2166-68, 2169-71, and 2175. The *Mansell* fastening, less clearly shown in figs. 2162-65 and 2177-78, is the mode of securing the tire to the wheel which becomes operative when the shrinkage of the tire alone is insufficient to prevent the latter leaving the wheel. In England the methods shown in figs. 2156, 2157 and 2158, are the most approved. No tire fastened by either of these methods has ever left the wheel, even when the tire has broken.

Toe (of a car-wheel flange). The extreme outer point where the wheel has the largest diameter.

Toe-nail. A nail driven in obliquely to fasten the end of a board or other piece of timber to the surface of another. The stick so fastened is said to be *toed*.

Toilet. Figs. 218, etc. Another name for a *saloon*.

Tongs, or crabs (pile-driver and wrecking cars). 22, figs. 1821-4, fig. 144. A device for anchoring the body of the car to the track when in use. A *jack-screw* is used in connection with the tongs to raise the body of the car, so as to bring a strain upon the tongs. See *Bolster jack-screw*, which is a different device for the same purpose.

Tool-box. 24, figs. 77-8. A box very frequently placed under the body of the car, especially in derrick or wrecking cars, for carrying tools and supplies.

Tool car. A box car arranged for carrying all kinds of tools, ropes, etc., which are used, in case of accident to trains on the road, in replacing or removing the cars or engines on or from the track. Such cars are often used when any heavy objects are to be moved, as is necessary in erecting bridges, etc.

Tool cars are also known as *block cars* and are often fitted up with sleeping berths for workmen. A tool car usually serves as a tender for every wrecking car.

Top. See *Base-top*, *cast-iron top*, *main-top*, *smoke-top*, etc., of Baker, Bissell, and other heaters, figs. 1800-1537.

Top arch-bar. Fig. 1785. More properly, simply *arch-bar*, which see.

Top-arm (Creamer brake, which see). 4, figs. 268-4.

Top-chord (of a truss). 13, figs. 2181-7. The upper outside member of a truss, especially one divided up into panels. The members of mere *trussed beams*, like figs. 2181-2, are not commonly designated as chords.

Top (or upper) cylinder-head (Westinghouse driving-wheel brake-cylinder). 5, figs. 314-5. See *Cylinder-head*.

Top door-rail. 149, figs. 158-85; 4, fig. 870. The uppermost horizontal bar or piece of a door-frame.

Top door-track. 65, figs. 87-96, 132-8. See *Door-track*.

Top end-rail (coal car). 137, figs. 105-7. A horizontal stick of timber which forms the top of the end frame.

Top light-rail (English). 103, figs. 304, 305. A part of the body-framing of a carriage forming the top of the window opening.

Top of case (Gouge heater). 79, fig. 1409. See *Case*.

Top of mouth-piece (Gouge heater). 4, fig. 1407. See *Mouth-piece*.

Top panel-batten (English). 107, fig. 305. American equivalent, *furring*. A part of the body-framing to stiffen the top-panel, which is pinned to it.

Similar parts
Outside top-

door-rail.
journal-box
the journal,
rarely used in
either oil or
figs. 1486-90;
on top of the

car.
See *Side-bear-*

The horizontal
the side. A
e.
1821-4. See

valve, which
pressed air is

Towel-rack. Fig. 1583. A tray for holding clean towels.

Towel-rod. Figs. 1587-90.

Towel-roller bracket. 2, figs. 1585-8, 1589. A bracket for supporting a *towel-roller*. There are two, the *fixed-end* and *loose-end* bracket. The principal supply of towels, however, is usually carried in a towel-rack or hung on towel-rods.

Track. A rail or bar which forms a path on which anything, as a door, runs. Sliding doors have usually two door-tracks, *bottom* and *top door-track*, as 65, 66, fig. 82, etc.

2. (Pile-driver car.) 47, figs. 1821-4. A circular track upon which the rollers of the swinging-platform travel. A *rack* is connected with it, as a part of the *slewing-gear*.

Track-sweeper. Fig. 70. A *sweeping car*, which see. For city use only.

Train-car. Figs. 44-7, etc. A *caboose car*, which see.

Train signal-lamp. 141, figs. 102-3. A lamp attached to a car as a signal, usually to the last car on a train, and commonly called a *tail-light*. See *Signal-lamp*. They are usually some form of lantern, like figs. 956-73. Lanterns of ordinary form, but usually with red globes, are also used.

tainty. If the train breaks in two the whistle is blown loudly for a considerable time.

Transom. 1. Primarily a cross-piece.

2. (Carpentry.) A horizontal piece framed across a door or double-light window. The term is also applied in the general sense of a cross-piece in other ways.

3. (Car-building, swing-bolster trucks.) 20, figs. 1912-07. One of two horizontal cross-beams attached to the side-frames, between which the swing-bolster is placed. They are usually made of wood, but recently they have been made of iron. See also *Middle-transom*. *Outside-transom* (six-wheel trucks, figs. 1969-73).

4. 22, figs. 82-92; 26, figs. 155-185. The *body-bolster* is also sometimes called a *transom* or *body-transom*, but incorrectly. The term *body-transom* is more properly limited, when used at all, to the *needle-beam* or *cross-frame tie timber*, which see.

5. (English.) Commonly spelled *transome*, which see. **Transom bearing-block.** A piece of wood or iron placed on top of a transom, under the attachment or bearing of a swing-hanger, to raise it up higher.

Transom-casting. 28, figs. 1912-40. A casting attached to a truck-frame and to which the end of one or both of the transoms are fastened.

Transom chafing-plate. 27, figs. 1955-69. A plate attached to the side of a transom to prevent it from abrasion.

Transome (English). 3, figs. 116-7, 204-6. A *needle-beam* or *cross-frame tie-timber*, which see. More commonly called *cross-bearer*, which latter term is also in use in this country.

Transom-pillar (diamond trucks). 29, figs. 1987-9. A small casting acting as a distance-piece between the transom and inverted arch-bar.

Transom tie-bar. 23, figs. 1955-67. A wrought-iron bar bolted to a pair of transoms, sometimes above and sometimes below, to hold them together.

Transom truss-block. 25, figs. 1945-6, 1955-69. See *Transom truss-rod*.

Transom truss-rod. 24, figs. 1945-6, 1955-69. Transverse rods attached at their ends to the wheel-pieces, which extend alongside the transoms and are inclined downward under a central *transom truss-block* so as to strengthen the transoms. Generally, two such rods are used with each truck.

Transom truss-rod washer. 26, figs. 1945-6, 1955-69. See *Washer*.

Transverse floor-timbers (tank and street cars). 11, figs. 189-42; 10, fig. 1848. Timbers which extend across the car underneath the floor and on which the latter rests. They are used only when there are only two sills. Not to be confused with *needle-beams*, which are under the sills.

Transverse tie-rod (English). 10, figs. 205, 206. American equivalent, *sill tie-rod*. A long rod which serves to bind together the *underframe* transversely.

Trap (for refrigerator car). E, fig. 181. An S-shaped pipe largely used in all forms of plumbing work for permitting the exit of water while preventing the entrance of air.

2. (Gouge heater.) 6, figs. 1405-7. See *Cinder-trap*.

Trap-door. A door in a floor or roof, closing flush therewith when shut.

By resolution of the Master Car-Builders' Association, 1884, it was recommended that a trap-door be added in the roof of passenger cars as a safeguard in case of accident. See also *Platform trap-door*.

2. (Janney-Miller coupler.) 68, figs. 602-85. A small iron door in the platform giving access to the centre buffer-yoke.

3. (Lorenz refrigerator car.) N, figs. 180-180½. A door in the floor, giving access to the drip-pan, etc.

Trap-door spring (Janney-Miller coupler). 65, figs. 602-85. The spring used to keep the trap-door securely closed.

Tread. 1. (Of a step.) The part on which the foot is placed. See *Tread-board*. *Rubber-tread*.

2. (Of a car-wheel.) 25, fig. 2002. The exterior cylindrical surface of a car-wheel inside of the flange which comes in contact with the rail. The usual width is about 4 in., measured from the throat or inside of the flange, and about 5½ in. out to out measurement, from outside of flange to outside of wheel. Variations of a fraction of an inch either way are as yet frequent, no standard section having yet been adopted.

Tread-board (of a step). 46, figs. 155-85. The horizontal part on which the foot is placed.

Treadle (for hand-car brake). 4, figs. 1724-6. (For pile-driver car winding-gear.) 42, figs. 1821-4. A foot lever connected to any form of machinery or to a brake, for actuating or controlling the same.

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Trough (refrigerator car). **K**, figs. 130-130 $\frac{1}{2}$.

Truck. 1. "A small wheel; hence *trucks*, a low carriage for carrying goods, stone, etc., either on common roads or on railroads. Indeed, this kind of carriage is often called a *truck*, in the singular."—*Webster*. The term is applied to different kinds of small vehicles used on and about stations for handling freight and baggage by hand, sometimes in a confusing sense. The usage seems to be increasing, however, to speak of baggage *barrows* and freight *trucks*, although both are sometimes designated as *barrow-trucks*, figs. 1898-1906. Four-wheeled vehicles, called *baggage wagon-trucks* and *freight wagon-trucks* are also used. Vehicles of this class are also designated as *warehouse-trucks*. Special varieties shown are the *telescope*, *swing-barrel* and *self-loading* trucks. Many others exist in limited use.

2. Figs. 1907-73. A *car-truck*, which is, mechanically, a small four-wheel (or sometimes six-wheel) car, under each end of an American car-body and carrying the latter as a dead load by means of two swiveling *centre-plates* connected by a *centre-pin* or king-bolt. The purpose of the truck is to enable short wheel-bases to be

For the price allowed for trucks by the rules for interchange of traffic, see *Freight-car*.

See also *Continuous-frame truck*. *Rigid-bolster truck*. *Swing-motion truck*.

Pair of trucks.

8. (English.) American equivalent, *freight car*. This term is never used in England in the American sense, the word *bogie* being used instead. *Truck* has precisely the same meaning and application as *wagon*, which see. See *Carriage-truck*.

Truck-bolster. 30, figs. 1907-68. A cross timber or beam in the centre of a truck to which the lower centre-plate is fastened, and on which the car-body rests. The truck-bolster is connected to the *body-bolster* by a *centre-pin* which passes through it. The truck-bolster for a six-wheeled truck consists of a frame formed of two timbers at each end, called *spring-beams*, which rest on the springs, and one in the centre, called a *truck centre-beam*, to which the truck centre-plate is attached. All three are united together by longitudinal iron bars or wooden beams. This is represented in fig. 1970. See *Swing-bolster*.

Truck-bolster chafing-plate (passenger trucks). 36, figs. 1960-9. A plate attached to a swing-bolster to protect it from wear.

Truck-bolster guide-bars (diamond trucks). 37, figs. 1907-11, 1927-32. More commonly called *columns*. Cast-iron posts between the *arch-bars*, held in place by *column-bolts*, which form a guide for the end of the bolster. They are not used with trucks which have a swing-motion, and only with rigid-bolster trucks when the latter have bolster-springs, which latter, however, are almost universal.

Truck-bolster guide-block. 38, figs. 1907-11, 1927-31. A cast-iron shoe for the end of a truck-bolster, which slides vertically between the *columns* or bolster guide-bars. They are used only in connection with the latter.

Truck-bolster jack-screws. 8, fig. 148. See *Bolster jack-screws*.

Truck-bolster king-post. 33, fig. 1950. See *King-post*.

Truck-bolster truss-block. 32, figs. 1910-1, 1927-32. See *Truss-block*.

Truck-bolster truss-rod (rigid-bolster trucks). 31, figs. 1907-49, etc. A rod attached near the ends of a wooden truck-bolster. In swing-bolster trucks, rods of a simi-

lar nature are used, as 24, figs. 1945-7, termed *transom truss-rods*.

Truck-bolster truss-rod bearing. 34, figs. 1907-42, etc.

Truck-bolster truss-rod washer. 35, figs. 1907-50.

Truck centre-plate. 63, figs. 1907-69. See *Centre-plate*.

Truck check-chain eye. 70, fig. 1963. See *Check-chain*.

A *body check-chain eye* is also used.

Truck check-chain hook. 69, fig. 1963. A hook on the end of a check-chain.

Truck details. Figs. 1974-2180.

Truck end-piece. 17, figs. 1907-73. See *End-piece*.

Truck-frame. Figs. 1907-2080. A structure composed of wooden beams or iron bars, to which the journal-boxes or pedestals, springs, and other loose parts are attached, and which forms the skeleton of a truck. See *Continuous truck-frame*. *Truck side-frame*.

Truck-frame king-post (continuous-frame trucks). 18, figs. 1948-50. The iron post in the centre of the side-frame between the two pedestals.

Truck-frame knee-iron (passenger-car trucks). 81, fig. 1956, etc. An interior *angle-plate* of cast or wrought iron to connect the truck-frame together.

Truck-frame queen-posts (wooden freight-car trucks). 39, fig. 1945. Short iron columns between an upper arch-bar or wheel-piece and an inverted arch-bar, which act as distance-pieces.

Truck knee-iron. 81, fig. 1956, etc. See *Truck-frame knee-iron*.

Truck-side. A *truck side-frame*, which see.

Truck side-bearing. Figs. 2028-30; 61, figs. 1907-69. A plate, block, or roller attached to the top of the truck-bolster, on which a corresponding bearing fastened to the body-bolster rests. Their purpose is to prevent the car-body from having too much rocking or rolling motion. They are made of various forms, such as a plain metal plate, to protect a wooden bolster from wear, a cup-shaped casting to hold oil or grease and waste, and various forms of *rollers*, balls, *rockers*, studs, and the like. See the names in italics.

Truck side-frame. Figs. 1907-2080. The longitudinal portion of a truck-frame, on the outside of the wheels, which extends from one axle to the other and to which the journal-boxes and bolsters or transoms are attached. See *Diamond-truck side-frame*, in designating which the term is chiefly employed.

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Truss-beam (Miller platform). 22, figs. 636-8. See *Plat-
form truss-beam*.

Truss-block. 4, figs. 2187-8. A distance-piece between
a truss-rod and the compression member of a trussed
beam, which forms a bearing for both. See *Body-bolster
truss-block*. *Transom truss-block*. *Truck-bolster truss-
block*. Figs. 215-26, 1907-73.

Trussed brake-beam. 4, figs. 245-6, 250-1.

Truss-plank (passenger-car frames). 63, figs. 155-85; 1,
fig. 695. A wide piece of timber bolted to, and usually
locked into, the posts on the inside of the car immediately
above the sills.

A substitute for the truss-plank and body truss-rod at
once is the *Challender truss*, which see, fig. 185b. The
end truss-plank, 32, fig. 186, is a continuation of the
latter across the ends of the car, for uniformity of finish.

Truss-plank cap. 64, figs. 175-6. A strip of wood at-
tached to the top of a truss-plank between the seat-
frames.

Truss-rod. 1, figs. 2181, 2187-8, etc. An inclined rod
used in connection with a king or queen-post truss, or
trussed beam, to resist deflection. It is attached to the
ends of the beam, and is supported in the middle by a

ably in part from its form. A distinction has been attempted between a *truss-rod bearing* and a *truss-rod saddle*, founded upon the direction of the strain which it resists, and this distinction has been preserved in figs. 2181-8 of this edition. It cannot, however, be said to be founded on usage, either of bridge builders or car-builders, except in respect to the *body truss-rod saddle*, as above stated.

Truss-rod iron. 24, figs. 159-67. A bar of iron, having an eye, to which a *body truss-rod* is attached, bolted to the under side of a sill below a body-bolster. It is an imperfect form of attaching body truss-rods almost out of use for freight cars and in decreasing use for passenger cars.

Truss-rod saddle. See note to *truss-rod bearing* and *body truss-rod saddle*, 20, figs. 88-188; 21, fig. 155, etc.

Truss-rod washer. 2, fig. 2181. A large flat or beveled washer, used under a nut on the end of a truss-rod. Sometimes called a *skew-back*. See *Body-bolster truss-rod washer*. *Truck-bolster truss-rod washer*.

Tubed oil-screws. Fig. 911. See *Oil-screws*.

Tubular car. A form of car construction recently introduced which consists in constructing the sills and floor-framing of iron gas-pipe. The plan has not yet come into general use, nor are its merits as yet generally admitted.

Tubular lantern. Figs. 968-4. A lantern having no guards except a rectangular frame of tubes through which the air-supply is also carried. They are in two forms, with *shade reflector* and *square* or *side reflector*.

Tubular square lamp. Fig. 906. See above.

Tufting button. Fig. 1230. A button used in upholstery to hold the cord which passes through the upper covering of the upholstered surface, dividing it up into squares or diamonds, producing the effect shown in the seats in figs. 212-3. Car-seats in general are not tufted.

Tumbler. 1. A drinking-glass.

2. (Foundry). A machine for cleaning castings, locomotive tubes, etc. It consists of a case mounted on a shaft on which it is made to revolve. The articles inside of the case are cleaned by their attrition against each other and the case.

3. (Locksmithing.) Figs. 1029-87, etc. "A latch engaging within a notch in a lock, bolt, or otherwise, opposing its motion until it is lifted or arranged by the key so as to remove the obstacle."—*Knights*. In the *Yale lock*, fig. 1028, the tumbler is simply a pin cut in two.

which, when the proper key is inserted, is raised to such a point that the joint of the tumbler comes exactly opposite the joint of the escutcheon, permitting the same to revolve.

Tumbler-dog (Miller's padlock). C, figs. 1036-7. A catch to hold the hasp locked except when it enters the tumbler.

Tumbler-holder. Figs. 1575-6. A bracket or stand for holding glass tumblers or drinking cups. They are either *single* or *double*.

Tumbler-spring (Miller's padlock). F, figs. 1036-7.

Turnbuckle. Figs. 1881-3; 23, figs. 155-85; B, figs. 1087-9; 28, figs. 363-5, etc. A device inserted in the middle of a long rod for changing its length. *Right and left screw turnbuckles*, or *single screw turnbuckles*, figs. 1881-2, are the most common, but *pipe* or *tube turnbuckles*, fig. 1883, have been shown to give the greatest strength for the same weight as well as the neatest outside appearance.

Turn-under (English). See *Fall-under*.

Twin door-panels. 10, fig. 370; fig. 1845. A pair of panels side by side in a door, formed by inserting a *parting-rail* into a wide panel.

Twin-washer. Fig. 1875. A *double-washer*, which see.

Twin-window. 138, figs. 161-8. Two small and rather narrow windows placed side by side. The tendency is to abandon the use of all such irregular forms.

Twisted flat wire (for car seals, which see). Fig. 1118. A form adapted to prevent the possibility of the lead seal being stripped from the wire and afterwards replaced upon it.

Two-group spiral springs. Figs. 2067-72, 2095-6, etc. See *Spiral springs*.

Two-horse street car. Fig. 1837. The most common form of *street car*, which see.

Two-light centre-lamp. Figs. 534, etc. See *Centre-lamp* and *chandelier*. The majority of centre-lamps as now constructed are two-light burners.

Two-spring slip-burner. Fig. 881. See *Slip-burner*.

Tyler-brake (street cars). Fig. 229. A simple form of brake-gear for applying outer-hung brakes from either platform. The pressure upon the brake-beams is not equal.

Tyre (of a wheel). See *Tyre*.

The spelling "tyre" is the English method and cor-

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spring-hanger.
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ceives the buffing and drawing strains, maintains the wheels in position and carries the weight of the floor and body of the vehicle. In vehicles for freight (*goods*) traffic the under-frame and body are rigidly connected (see figs. 116-9) and mutually stiffen and strengthen one another; but in passenger vehicles (see figs. 204-7) the body is framed as an independent structure, and merely rests on the under-frame, rubber pads (*India-rubber body-cushions*) being interposed to deaden shocks. The only connection is through a *body holding-down bolt*, which see. The line of draught and buffing passes through the centre of the horizontal plane, in which all the members of the under-frame lie.

Under-frame plate (English). See *Spider-plate*.

Under-hung door. A sliding-door which is supported and slides on a rail below the door. The door in fig. 82 is under-hung, but *over-hung* doors, especially with anti-friction *car door-hangers*, are increasingly preferred.

Union (pipe-fittings). A *union-joint*, which see.

Union-joint (pipe-fittings). Fig. 1348; 14, 35, 41, etc. figs. 293-9. A means of uniting the ends of two pipes with a nut. The latter is attached to one pipe with a collar, and is screwed on the opposite pipe, or on a thimble attached to the pipe. Often called simply a

upon each other in any direction. The steam pipes of locomotives are connected with a joint of this kind, and it is the purpose of the modification of the form of centre-plates shown in figs. 1980, 2107-9.

Universal shade-ring. Fig. 989. A shade-ring, which see, so constructed as to be of adjustable diameter.

Upholstery. In passenger-car construction, the cushions, curtains, carpets, beds, etc., and generally the material from which they are made.

Upholstery details (of seats). Figs. 1205-1230. See also *Sleeping-car furnishings and details*.

Upper-bearing (swing link-hanger, which see). 6, figs. 2110-1.

Upper bell-crank bracket ("American" automatic compression brake). 13, figs. 368-9. See *Compression-brake*.

Upper bell-crank rod. 14, figs. 368-9. See *Compression-brake*.

Upper belt-rail (passenger car exteriors). 82, figs. 175-6; 44, figs. 1848-4. A horizontal bar attached to the posts on the outside and above the windows.

Upper-berth. 2, 3, figs. 676-9. The top berth in a sleeping-car section. It folds up by day against the roof, being secured by a *berth-latch* or *safety berth-latch*, leaving a pocket above it in which the head-board, two thin mattresses and the bedding are stored. See *Berth*. In the Mann boudoir cars, the upper berth, B, figs. 680-1, is the sofa-back by day.

Upper-berth bracket. Fig. 1236. A form of *upper-berth rest* closely resembling a bracket.

Upper berth-curtains (Mann boudoir car). 12, figs. 680-1. See *Berth-curtain*.

Upper-berth hinge (Mann boudoir car). F, fig. 680-1. A hinge at the top of the sofa-back by which the latter is lifted up into position to form the upper berth. The outside edge is supported on the *upper-berth rest*, 12, fig. 681.

Upper-berth pocket. 33, figs. 678. A pocket against the sides of the car which closes up flush therewith when the upper berth is folded up, but drops open when the berth is made up, so as to afford a receptacle for clothing and baggage. Similar pockets for the lower berth are carried on the head-board and are called *head-board pockets*.

Upper-berth rest (sleeping cars). Figs. 1233, 1244.

metal lug, or shelf, which supports an upper-berth when lowered.

2. (Emigrant sleeping-cars.) I, figs. 682-5, 1293. An attachment for leaving the upper-berth partially open by day for ventilation. Another upper-berth rest M is attached to the *berth-post*.

Upper-berth rest (Mann boudoir cars). 12, fig. 681. See *Upper-berth hinge*.

Upper-berth-rest pivot. Fig. 1234. A pin attached to a plate fastened to an upper-berth. The pin engages in a hole in a *berth-rest*, which see.

Upper-berth-rest plate (Mann boudoir cars). 11, figs. 680-1. A plate permanently fastened to the window-frame to carry the *upper-berth rest*.

Upper brake-shaft bearing. 96, figs. 82-143; 156, figs. 155-85. An eye by which the upper end of a brake-shaft is held in place. In passenger and street cars, usually attached to the hand-rail; on freight box-cars, when the brakes are operated from the roof, to the end of the body near the top.

Upper-cap (triple-valve of Westinghouse brake). 4, figs. 332-3.

Upper corner-plate. 55, figs. 82-143. See *Corner-plate*.

Upper (or top) cylinder-head (Westinghouse driving-wheel brake-cylinder). 5, figs. 314-5. See *Cylinder-head*.

Upper deck (passenger cars). 110, figs. 155-85, etc. Also called *clear-story*. The raised central portion of the roof. See *Deck*.

Upper-deck carline. 8, fig. 186; 118, figs. 155-35. Carlines, which see, passing from side to side of the upper deck only, resting on the *deck-plate*. Usually called simply *deck carline*.

Upper-deck eaves-moulding. 119, fig. 174, etc. A moulding, usually called simply *deck eaves-moulding*, on the outside edge of the roof.

Upper deflector (Gouge heater). Fig. 1447. A part to cover the opening in the deflector-end of case. See *Deflector*.

Upper diaphragm case (engine signal-valve, Westinghouse train-signal apparatus, which see). 3, fig. 690. See also *Diaphragm*.

Upper discharge-valve (air-pump for Westinghouse brake). 30, fig. 298; 32, fig. 299. A puppet-valve at the top of

compressed air

See *Door-*

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Urinal-drip, or drip-pan. Fig. 1103. A pan under a urinal on the floor.

Urinal-pipe. Fig. 1103. See *Urinal*.

Urinal-handle. Figs. 1106-7. A handle in a saloon, placed above the urinal to hold on to. They are distinguished as *corner* or *side urinal-handles*, according to their position on the side of the car.

Urinal-safe (parlor-car water-closets). Figs. 1087-89. A plate covering the top of the bowl to prevent nuisance in the inclosed parts.

Urinal-ventilator. Fig. 1102. A pipe attached to a cap on a urinal, communicating with the top of a car, where some form of *wind-scoop* is often added.

"Utility" double-acting spring-hinge. Fig. 788. See *Double-acting hinge*.

"Utility" tail-light. Fig. 963. See *Signal-lamp*.

V

Vacuum-brake. Figs. 266-92. A system of continuous brakes which is operated by *exhausting* the air from some appliance under each car by which the pressure of the external air is transmitted to the brake levers and

Recipient filling-valve.
Recipient-valve.
Register-valve.

Upper steam-valve.
Ventilator-valve.
Water-cooler valve.

Valve-chain (of injector-pipe, Gouge heater). 76, figs. 1418-4. The means for regulating the valve to control the supply of air.

Valve-key (Pintsch gas-lighting apparatus). Fig. 823. A key for opening all the high-pressure valves, the *lamp-key*, fig. 823, being used for the low-pressure valves connected with the burners.

Valve-knob (Eames dividing attachment). 62, figs. 274-5. The knob for operating the valve.

Valves (for top-plate of Spear heaters). Two semicircular dampers.

Valve-seat. "The flat or conical surface on which a valve rests."—*Knight*. See *Discharge-valve seat*. *Tank-valve seat*.

Valve-shell (upper and lower, "American" steam brake-valve). 1-2, figs. 360-2.

Valve-stem. A rod attached to a valve, and by which the latter is moved, is always called a *valve-stem*. See "American" steam brake-valve, 6, figs. 360-2. *Eames dividing attachment*, 63, figs. 274-5. *Howard's parlor-car water-closet*, figs. 1067-89. *Westinghouse pump governor*, 9, fig. 816, etc. See also *Reversing-valve stem*.

Valve-stem nut ("American" steam brake-valve). 7, figs. 360-2. The nut fastening on the handle.

Van (English). A comprehensive term for any covered vehicle not used for conveying ordinary passengers or ordinary freight. See *Brake-van*. *Bullion-van*. *Guard's-van*.

Van Liew grain-door. Figs. 877-82. One of the numerous devices for speedily removing and returning to place a grain-door. It consists principally of *stanchion guide-rod F*, standing in the *guide-rod socket* generally, on which a *stanchion 3*, attached to a *stanchion socket 2*, freely slides. The latter is attached to the grain-door. The door is locked into place by the *lug I*, confining it to the *grain-door guide O*. When not in use it is confined in a vertical position by the *floor-stop g*, and the *side-stop H*.

Varnish. A "liquid-glass" for covering paint or wood-work. See *Finishing varnish*.

Veneer. A thin leaf of a superior wood for overlaying

an inferior wood."—*Webster*. See *Ceiling-veneers*. *Perforated-veneer*.

Vent. "A small aperture; a hole or passage for air or other fluid to escape."—*Webster*. See *Lamp-vent*.

Ventilating head (Gouge heater). Fig. 1440. See *Head*.

Ventilating jack (for saloons). Figs. 1092-4. Also called *wind-scoop*. A flaring horizontal tube, constituting a simple form of the ventilating devices which use the current produced by the motion of the cars to cause an exhaust current of air. See *Wind-scoop*. *Injector*, etc.

Ventilator. Figs. 1552-63. Also figs. 1606-33; and 116, 142, 143, figs. 155-85. A device for admitting or exhausting air to or from a car. Ventilators according to their position are designated as *deck ventilators* (end or side), *end ventilators*, *frieze ventilators*, etc. They are often designated, sometimes without truth, as *automatic* or *self-acting*. The prominent forms of the latter varieties are shown in figs. 1557-61. See also the various wind-scoops shown with car-heaters and saloon furnishings. An exhaust-ventilator, for saloon-hoppers, attached to the under side of cars (*Bell's exhaust*, which see), is shown in figs. 1097-8. Ventilators for boarding cars, tool cars, work trains, etc., are also put in the floor, a trap-door being placed there provided with gratings underneath. Among the prominent ventilators are the *Globe*, *Excelsior*, *Creamer ventilator-plate*, etc., which see. The proper system of ventilation for passenger cars is still a mooted question. The supply of air required for each person, for good ventilation, is at least two cubic feet per minute.

The ventilation of the Mann boudoir cars is very elaborate, and perhaps the most perfect now in use. No air is intended to be admitted within the car by the windows or otherwise, except through an in-take or wind-scoop. The air thus collected is forced downward into the bottom chamber over the ice and filter closet, where it first passes through a quantity of "Excelsior" mattress packing or other fibrous mass, loosely held up on pins and moistened by the melted water from the ice, through and around which the cleansed air then passes and then enters the *heater-room*, where in winter it is heated and in summer escapes cooled through a flue extending the length of the car down the corridor, into which it is discharged by a series of registers oppo-

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of a ventilator to prevent the entrance of sparks, cinders, rain, or snow. It is sometimes intended to direct the current of air either into or out of the car. See also *Deck end-ventilator hood*.

2. (English.) 134, figs. 204, 205. Also called *ventilator-cowl*. A shield made of either wood or metal, preventing the entrance of rain or cinders.

Ventilator-netting (fruit cars). D⁴, figs. 121-5.

Ventilator-opener. See *Deck-sash opener*, figs. 1603-26.

Ventilator-panel. 116, figs. 158, 173, 184, etc. A panel in the frame of a valve or door for closing the aperture of a ventilator.

Ventilator-pivot. A pin on which a ventilator door or sash is swung or hinged. It is the same as a *deck-sash pivot*, fig. 1611. See also (for fruit car) F₁, figs. 121-5.

Ventilator pivot-plate. The same as a *sash-lock plate* or *stop*, figs. 1655-7.

Ventilator-plate. See *Frieze ventilator-plate*, figs. 1562-3.

Ventilator-register. Fig. 1553. A metal plate or frame attached to a ventilator opening, provided with slats arranged so as to turn and thus either open or close the ventilator. They are chiefly used as *frieze-ventilators*, but sometimes elsewhere. In sleeping cars they are

Vertical telegraph cock, or faucet. Fig. 1595. See *Telegraph cock*.

Vestibule (parlor and sleeping cars). Figs. 210, etc. The part of the car nearest the door, cut off from the main saloon by an interior door. It is occupied by the saloon, washing and heating arrangements, etc. Its purpose is to give protection to the interior of the car against drafts and noise.

"Vienna" lamp-shade. Fig. 946. See *Lamp-shade*.

Volute spring. Fig. 2052. A spring made of a flat bar of steel coiled with a kind of scroll resembling the volutes used as an ornament in the capitals of ancient Roman and Grecian architecture. The coil is made in a conical form, so that the spring can be compressed in the direction of the axis around which it is coiled. They are now little used in this country, but largely in Europe.

Vose graduated-spring. Fig. 2045. A round-bar single-coil spiral-spring, with two conical india-rubber springs on the inside. Now little used, all-steel springs by the same inventor and others having supplanted it. See *Graduated spring*.

V-shaped screw-thread. Fig. 1827. A thread with a sharp edge at the top and sharp groove at the root. The Sellers (U. S.) standard thread, fig. 1829, is flat at the top and at the root, and the Whitworth, fig. 1829, is rounded at those points. V-threads are now used chiefly for pipe-threads.

Vulcanised fibre. A leathery material of great durability and toughness, which is made by subjecting various kinds of vegetable fibre to the action of acids. It is insoluble in all ordinary solvents, such as oil, alcohol, ether, ammonia, etc. It is made in two classes, *hard* or *flexible* (the former being that used generally in car construction for the dust-guards of journal-boxes, fig. 2018), and in sheets from 16 to 24 in. wide by about 50 in. long and from $\frac{1}{16}$ in. to $\frac{1}{2}$ in. thick. Another name for the same article is *gelatinized fibre*.

V window-button. Fig. 1652. A catch, with a V-shaped notch in the end, fastened to a window-post to hold up a window. Little used.

W

Wagon, or goods wagon (English). Figs. 116-119. American equivalent, *freight car*. A vehicle (always four-

wheeled), used to convey any sort of merchandise, minerals or live stock, and run on freight trains. *Truck* is a synonymous term largely used.

See *Ballast wagon.**
*Batten wagon.**
*Boiler wagon.**
Box wagon.
Cattle wagon.
Covered wagon.
Goods wagon.

*High-sided wagon.**
*Low-sided wagon.**
*Medium-sided wagon.**
*Open wagon.**
*Rail wagon.**
*Timber wagon.**

Wagons marked thus * are open wagons (*gondola cars*), having no roof.

Wagon-coupling, or draw-chain (English). 41, 42, figs. 116, 118. The draft coupling universally used on freight cars (*goods wagons*) in England in connection with a *draw-hook*, which see.

Wagon-sheet (English). See *Tarpaulin*.

Wagon-truck. Fig. 1896. A four-wheeled vehicle for moving baggage or freight about a station or warehouse. See also *Baggage wagon-truck*, fig. 1902. *Freight wagon-truck*, fig. 1899. Two-wheeled vehicles of the same kind are known as *baggage-barrows* and *freight-trucks*, both sometimes designated as *barrow-trucks*.

Wagon-wheel (English). Figs. 2165, 2180. See *Wrought-iron wheel*. *Steel tired wheel*. These engravings give the almost universal standards for English freight service.

Wainscot-panel. 76, figs. 155-85; 4, figs. 692-5; 23, fig. 186. A board which forms a panel under the windows between the two *wainscot-rails*.

Wainscot-rails (passenger car interiors). 74, 75, figs. 159-60, 175-6; 2, 3, figs. 694-5; fig. 186. Longitudinal wooden strips fastened to the posts and extending from one end of the car to the other. The *lower* wainscot-rail comes immediately above the truss-plank; the *upper* wainscot-rail is immediately under the window. The *wainscot end-rails*, 26, 30, fig. 186, are the wainscot-rails at the end of the car.

Waist-panel (English). 124, fig. 205. The panel immediately above the lowest panel on the outside of a carriage body.

Waist-rail (English). 100, figs. 204-5. A horizontal piece in the framing of the side of a passenger carriage.

Wall seat-end. 4, figs. 1120-2. The seat-end next the wall or side of a car, so called in distinction from the *aisle seat-end*.

Wards (of a lock). 5, figs. 1081, etc. The interior circular

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cers' cars it is placed in various irregular positions to leave the ends of the car free.

Wash-room furnishings. Figs. 1570-90.

Wash-room pump. Figs. 1570-1. More properly *basin-pump*, which see. They are either *single* or *double-acting*.

Wash-stand (postal cars). Fig. 1065. A cast stand carrying a basin. They are distinguished as corner or side wash-stands. They are used in ordinary passenger cars.

Wash-stand sink. 3, fig. 1600. A cast-iron plate with one or more bowls, made in one piece and lined with porcelain and used for the top of a wash-stand. Used only in second-class cars.

Wash-stand slab. 3, fig. 1570. A stone slab which forms the top for a wash-stand. Commonly, simply slab.

Waste. The spoiled bobbins of cotton mills, used for wiping machinery and for *journal-packing*, which see. Although valueless for the manufacture of cloth, the consumption is so large that waste is quite expensive. A cheaper substitute for use as journal-packing is *patent-waste*, which see.

Waste-cock. 1. (Searle and Baker heaters.) H, fig. 1434-5. A cock attached to the *expansion-drum* or *circulating-drum* of the Baker heater for drawing off or changing

in passenger cars. At present it is mainly confined to private cars. It is sometimes provided with an upholstered cover, and is then known as a *concealing water-closet*. See *Howard's parlor-car water-closet*.

Water-cooler. 133, fig. 156; 1, fig. 1600. A tank or vessel for carrying drinking water which is usually cooled with ice. The sides are generally made double, and the space between filled with some non-conducting substance. They frequently extend to the roof. See *Water-alcove*. *Water-tank*.

Water-cooler furnishings. Figs. 1591-1602.

Water-cooler stand. 3, fig. 1600.

Water-drip. A pan or receptacle to receive the waste water from a water-cooler. A *drip-pipe*, or *waste-pipe*, connects with it.

Water-cooler valve or waste-cock. Figs. 1597, 1601. See *Tank waste-cock*.

Water-table. 1. (Masonry.) A projecting beveled face of stone to shed water from the parts below. Hence, especially applied to the top course of a foundation, which nearly always has such a face, the masonry above being set back.

2. A *window-ledge*, which see.

Water-tank. 133, figs. 187-9, 1600, etc. A vessel or reservoir for holding water. Those used on cars for drinking water are usually made of sheet-iron, and often extend through the roof as in fig. 908. They are then usually drawn from by a *water-alcove*, fig. 1594, the tank being usually in the corner of the saloon concealed from the interior of the car. Simpler forms like 1600 are much used. The tanks for supplying wash-room basins, 1, fig. 1570, are usually placed immediately under them and drawn from by a *basin-pump*.

3. (Howard's parlor-car water-closet.) Figs. 1087-99.

Waved mouldings. 1 to 15, figs. 1050-64. Mouldings which by a special machine are made of a corrugated section longitudinally, the number of waves or corrugations varying from 3 to 6 per inch. The cost of the mouldings is increased by this waving from $1\frac{1}{4}$ to $2\frac{1}{4}$ cents per foot.

Weather strips. Figs. 1698-99. A rubber strip with a metallic or wooden binding to apply around the crevices of windows or doors, for excluding of dust and wind, and for preventing water from entering around the windows. Weather strips are divided generally into *single-*

edge strips, fig. 1698, and *cushion strips*, fig. 1699, both being usually provided, as now manufactured, with a metal *moulding*. The cushion strip is simply rubber, folded over so as not to show a selvage edge. The standard widths of weather strips are $\frac{1}{4}$, $\frac{1}{2}$, and 1 in. They are usually made in lengths of fifty feet, but some of the cushion strips in lengths of only 7 ft.

Web (of a key). The solid portion of the *bit* of a key, the recesses cut away being termed *wards*. See *Bit*.

Webbing. A strong fabric, from one to four inches wide, made of hemp or other material which is not liable to stretch, used in upholstering car-seats. The ends of the spring-seat in fig. 1207 are of webbing, the top being either vulcanized fibre or leatheroid.

Wedge. 1. A term in quite general use for a *journal-bearing key*, which see. Figs. 1985-2001. See also *Stop-wedge*.

2. (Cowell platform and coupler.) See *Adjusting-wedge*.

3. (Miller platform.) 19, fig. 640. The *uncoupling-lever wedge*, attached to the platform by a *wedge-chain*.

Wedge-chain. 20, fig. 640. See above.

Weigh-bar (English). See *Brake-shaft*.

Well (Moehring argand lamp). C, figs. 849-50. A receptacle for the drip from the wick.

Westinghouse air-brake. A system of continuous brakes invented and patented (the first patent in 1869) by Mr. George Westinghouse, Jr., which is operated by compressed air. The air is compressed by a steam air-pump on the engine, and is stored up in a tank called the *main reservoir* on the engine or tender. When the brakes are applied the compressed air is conveyed from the tank by pipes connected together between the cars by flexible *brake-hose* to *brake-cylinders* under each car, by means of which the pressure of the air is communicated to the brake-levers, and thence to the brake-shoes. This was the first form of brake invented by Mr. Westinghouse; a later and improved form is the *Westinghouse automatic air-brake*, commonly called simply *Westinghouse brake*, which is now in almost universal use. A few roads throughout the country still adhere to the original form of the Westinghouse non-automatic brake, but for several years no new roads have been equipped with them. At the present time the *Westinghouse brake*, unless other-

mean the auto-

Westinghouse auto-brake made from air-brake (see) to carry a full pressure and cause this pressure that the break-pressure by es- would apply further advan- made quicker required for reservoir at one to fill all the placed under re as in the ingenious valve pipe, auxiliary such manner pipe opens a reservoir to the

air on either side will close it. They are not in very wide use.

Westinghouse freight-brake. Figs. 336-57. A device not differing essentially from the Westinghouse passenger brake-gear except that the parts are made lighter and cheaper for use on freight cars. To this end the triple valve, reservoir and brake cylinder are commonly combined in one part, as in fig. 352. The engine, air-pump and main reservoir on the contrary are made somewhat larger. Special arrangements for operating extra long trains and on extra heavy gradients have been introduced, as shown in the engravings.

Westinghouse train-signaling apparatus. Figs. 687-91. A device for utilizing the supply of compressed air required for operating the Westinghouse brakes to transmit signals to the engine instead of using the ordinary bell-cord. See *Train signaling apparatus*.

Wheel. 1. A circular frame or solid piece of wood or metal which revolves on an axis.

See *Brake-wheel*.

Gear-wheel.

Hand-wheel.

Brake ratchet-wheel.

Ratchet-wheel.

Spur-wheel.

Winding-shaft ratchet-wheel.

2. Figs. 2124-80. A circular frame or disk, as above

At the 16th M. C. B. Convention, Philadelphia, 1882, it was

"Resolved, That the sense of this meeting is that all the gauges recommended by the Committee on Wheel Gauge should be in use in all repair and car building shops of every equipment."

Wheel-bore testing gauge. Fig. 2121. One of the M. C. B. standard gauges.

Wheel-bar (iron six-wheel truck). A, figs. 1971-3. A substitute in iron for a wooden *wheel-piece* to which the pedestals are attached.

Wheel-boss (English). 26, figs. 116, 118. American term, *hub*. The centre of the wheel, which is bored out to receive the axle.

Wheel-box (street cars). 13, figs. 1843-4. A covering for a wheel which projects through the floor. The sides are usually of wood and the top of sheet-iron, but they are sometimes made entirely of wood or metal.

Wheel-box button. 14, figs. 1843-4. A stick of wood attached by a bolt to the top of a wheel-box so that it can be turned, somewhat like a door-button, to hold the wheel-box in its place.

Wheel centre, or skeleton. 26, 27 and 28, figs. 116 and 119. The whole of a railroad wheel, except the tire, and the fastenings which connect the tire to the rim.

Wheel-centre (steel-tired wheels). Figs. 2167-80, etc. The portion of a wheel inside of the tire, and between it and the hub or boss. The wheel-centre is sometimes in one piece and sometimes made up of two parts, the *hub* or *boss* and the *central filling-piece*, which see. *Face-plates*, front and back, are then usually also used. The term is seldom applied to chilled or cast wheels.

Wheel-centre flange (Atwood's hemp-packed wheel). G, fig. 2167. A flange on the wheel-centre designed to protect the hemp packing on the inside.

Wheel-cover (English). 188, figs. 204-6. See *Splasher*.

Wheel-cut glass. The ordinary process of glass cutting, which leaves a perfectly polished and perfectly transparent surface.

Wheel-flange. 26, fig. 2002; figs. 2150, etc. The projecting edge or rim on the periphery of a car-wheel for keeping it on the rail.

Wheel-piece. 10, figs. 1842-7, 1955-69, 2025. A stick of timber in a wooden-frame truck, which forms the side of the frame and to which the pedestals are attached. It

is often stiffened by outside and inside *wheel-piece plates* or by a *wheel-piece truss-rod*, the latter serving also as a *wheel-piece tie-rod* to tie the two end-pieces firmly to the wheel-pieces. A wheel-piece tie-rod is in all cases used, but it is not always used in the form of a truss-rod. Iron wheel-pieces are sometimes called *wheel-bars*.

Wheel-piece plate. 11, 12, figs. 1968-9. See above.

Wheel-piece tie-rod. See above.

Wheel-piece truss-rod. 13, figs. 1955-67. See above.

Wheel-plate. 1. (Cast-iron wheels.) 22, fig. 2002. That part of a plate car-wheel which connects the rim and the hub. It occupies the place and fulfills the same purpose as the spokes do in an open or spoke wheel. See *Car-wheel*. *Wheel*.

2. (Steel-tired wheels.) Figs. 2159-71. See *Face-plate*.

3. (English.) 188, figs. 204-6. See *Splasher*.

Wheel-ribs (cast-iron wheels.) Figs. 2125-37. More commonly, *brackets*. Projections cast usually on the inner side of plate car-wheels to strengthen them. They are placed in a radial position and are often curved so as to permit the wheel to contract when it cools.

Wheel-seat or wheel-fit (of an axle). C, fig. 2002; 1974-5. The part which is inserted in the hub of a wheel. It is made truly cylindrical and very slightly larger than the *axle-seat* of the wheel. The wheel is pressed on it by hydraulic pressure and very rarely becomes loose. When this occurs, or the axle was turned too small, *prick-punching* and even *shimming* the seat has been resorted to to make a tighter fit, but this is forbidden by the rules for the interchange of traffic, nor has the practice ever been common, except as a hasty and somewhat dishonest expedient.

Wheel-timber. A *wheel-piece*, which see.

Wheel-tread. 25, fig. 2002. The outer surface or part of a car-wheel which bears on the rails. The standard width of wheel-tread, as recommended at 16th Annual Convention in Philadelphia, 1882, is 5½ in., measured from outside of tread to inside of flange, i. e., including the entire thickness of the flange. See fig. 2151.

White-metal band. 0 to 5, figs. 1199-1204. More properly *seat-back moulding*, which see.

White's "anti-friction" car-door hanger. Fig. 797. See *Car-door hanger*.

Whitworth gauges. See *Cylindrical gauge*.

Whitworth system of screw-threads. A system of screw-

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Diameter of screw..	No. of threads per in.....
$1\frac{1}{8}$	5
$1\frac{1}{4}$	5
$1\frac{3}{8}$	$4\frac{1}{2}$
2	$4\frac{1}{4}$

above. See

18 in. more than the New York central standard box car. Door opening 5 ft.

Wicket. See *Fare-wicket* (street cars).

Wick-sleeve (of student lamp, which see). I, fig 852-4.

Wide gauge. In general usage, the distance between the heads of the rails of a railroad when it is *slightly* greater than 4 ft 8½ in. in distinction from *broad gauge*, which see, which means a material increase, as to 5 ft. or 6 ft. Wide gauge is often used on curves, but its expediency is disputed.

Wilson's flexible car-window blind. Figs. 1645-7. A form of blind, consisting of perforated *slats* strung up on *slat-wires*, which is so flexible that it can be pushed up into a *window-blind pocket* on the inside of the lower deck of the car, thus enabling higher windows to be used. The slats are counter-bored and kept separate at the proper distance by a *thimble* strung upon the wire. Another device to accomplish the same end is the *Paul blind*, which see.

Wind-guard, or protection-cap (Harrison postal-car chandelier). B, figs. 841-2. A covering over the smoke-bell pipe.

Winding-arbor. 4, figs. 109-12. See *Square-end*.

and some are specially adapted to machines which revolve on their bases, as cranes, derricks, etc."—*Knight*. See *Derrick*.

3. A *brake-shaft* is sometimes called a *brake-windlass*, which, however, is little authorized by the meaning of the word.

Window. Figs. 692-5, 194; 137, figs. 155-85, etc. "An opening in the wall of a building or car for the admission of light and of air when necessary. This opening has a frame on the sides, in which are set movable *sashes* containing panes of glass."—*Webster*. Hence the window itself, especially in compound words, is often termed simply the *sash*. In England, carriage windows are technically termed *lights*. See also *Deck-sash*. Car windows are now generally made of uniform size throughout, but *tin windows*, *small windows*, etc., are used, as in figs. 54, 164-8. In sleeping and parlor cars *double windows* are almost always used to inclose an air-space between them and prevent radiation of heat and drafts.

Window-balance (or *sash-balance*, which see). Figs. 1708-7. A device in which a spring is used instead of a weight to counterbalance the weight of the sash and glass.

Window-blind. 140, figs. 155-85; 17, 18, figs. 692-3, etc. A wooden screen composed of a frame called the *sash*, carrying *slats*, placed in a window to exclude sunshine. Window-blinds, especially in street cars are sometimes made *single*, but for lack of room to raise so large a sash, they are usually made *double* and distinguished as *upper* and *lower*. *Flexible window blinds*, which see (figs. 1645-7), of recent introduction, known as the Wilson and Paul flexible window-blinds, are designed to obviate the difficulty of using a large window with a single sash or even with double sashes, by constructing the blind so that it can slide up into a curved pocket under the roof of the car. In sleeping and parlor cars *shades* are used instead of blinds, and the same usage is extending to ordinary "first-class" passenger cars.

Window-blind bolt. Fig. 1607, 1680. A bolt used for holding a window-blind in any desired position. It enters into a *window-blind-bolt bushing* or *plate*.

Window-blind-bolt bushing. Figs. 1654, 1681. See above. Same as *sash-lock bushing*.

Window-blind-bolt plate. Figs. 1655-7. See above. Same as *sash-lock plate*.

Window-blind lift. Figs. 1678-83, etc. Commonly called simply *blind-lift*. A metal hook fastened to the blind for raising and lowering it, usually attached to the bottom-rail, but in street-car-blinds, which are lowered below the window, to the top-rail. Window-blind lifts are distinguished as *single* and *double*, the single lift being the upper, and the double lift the lower, which has a projection for raising the outer part. Double window-blind lifts are also distinguished as *lower* and *upper*. The upper lift differs from the lower by *not* having a lug or ledge, which is carried on the lower blind for the purpose of engaging with the upper when the lower one is half raised, so that the two may thereafter be raised together.

Window-blind mullion. 15, figs. 692-3; 72, fig. 1648. An upright bar in the centre of a window-blind sash.

Window-blind pocket (Wilson's flexible car-window blind). G, fig. 1646. A curved cavity under the lower deck of a passenger-car roof for the reception of the blind when thrown up away from the window.

Window-blind pull. A *window-blind lift*, which see.

Window-blind rail. 14, figs. 692-3; 71, fig. 1648. A horizontal bar of a window-blind sash.

Window-blind rest. 1. A wooden strip to fill up the lower part of the groove in which an upper window-blind slides, and on which it rests when down.

2. (Street cars.) 49, fig. 1844. A horizontal strip of wood which extends from one body-post to another, on which the blind rests when it is lowered.

Window-blind sash. 86, figs. 155-85; 13, 14, figs. 692-3, etc. The frame in which the inclined thin *slats* are held.

Window-blind slat. 17, 18, figs. 692-3. See above.

Window-blind spring. Figs. 1648-51. The same as a *Sash spring*, which see.

Window-blind stile. 13, figs. 692-3. An upright bar in a window-blind sash.

Window-blind stop. 19, fig. 692, etc. An *Inside window-stop*, which see.

Window button. Figs. 1652-5. A small piece of metal swiveled by a screw which supports a window when open. There are two leading forms, L or *monkey-tail* and

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Window-curtain roller. Figs. 1683-92. More properly, a *shade*, or *window-shade roller*, which see.

Window deflector-ventilator. See *Deflector and ventilator*.

Window-fastener. Figs. 1659-61. A *sash-lock*, which see.

Window-furnishings (for deck-sashes). Figs. 1603-45. (For lower windows.) Figs. 1646-1707.

Window-glass. 6, figs. 692-5, etc., etc. Panes of glass used for windows. They are either *plate* or *rolled* glass, made by pouring the molten glass on to a table having the height of the desired thickness of the plate, and then passing a roller over the top, or *blown*, or common *window-glass*, the latter being by far the cheapest and most widely used, but of very much inferior quality. It is made by blowing the glass into a large bulb, which is then slit open while still hot and flattened out.

Window-grating. A wrought or cast-iron partition made of bars, or in other form, placed on the outside of the windows of passenger cars to prevent passengers from putting their heads or arms outside. Now rarely used.

Window-guards (street cars). 77, fig. 1845. Small metal rods to act as fenders for the end windows.

Window-holder. A *window-button* or *sash-holder*, which

Window-moulding base. 10, figs. 692-3, etc. An ornament made of wood or metal attached to the lower end of a window-moulding.

Window-moulding joint-cover. 9, figs. 692-3, etc.; fig. 1697. A piece of metal or wood used to cover the joints of window-mouldings when two pieces join each other.

Window-panel. 24, figs. 676-8, etc. See *Panel*. A panel between the windows known as *inside*, *outside* and *end*.

Window-panel furring. 59, figs. 155-85. Horizontal distance-pieces between the window-posts to which the paneling is fastened.

Window-post (passenger cars). 58, figs. 155-85. A post extending from sill to plate at the side of a window-opening against which the sash and blind slide.

Window-rail. 12, figs. 692-5, etc. A horizontal bar in a window-sash.

Window-rod bushing. Fig. 1067. A support for the ends of a *curtain-rod*, which see.

Window-sash. 85, figs. 155-85; 11-12, figs. 692-5; 65, 66, figs. 1848-6. See *Sash*.

Window-sash holder. See *Sash-lock*. Figs. 1659-61, etc.

Window-sash lift. A *sash-lift*, which see. Figs. 1665-72.

Window-sash rest (street cars). 50, figs. 1844. A strip of wood extending from one body-post to another, on which the sash rests when lowered.

Window-sash spring. Figs. 1649-50, etc. See *Sash-spring*.

Window-shade. A window-curtain, which is rolled on a roller above the window, in distinction from one which is drawn aside. In car-building it is nearly always finished at the bottom with a *window-shade leather* and heavy *window-shade rod*, both of which are almost invariably like fig. 1688. A rectangular slot, which is somewhat inaccurately called an *eyelet*, is inserted in the leather to fasten the shade down by slipping it over the sash-lift. In passenger cars window-blinds are generally used and not shades, but nearly all sleeping and parlor cars and many of the newer passenger cars have window-shades in place of blinds. Some form of automatic *shade-roller*, which see, is nearly always used, the old fashioned pulleys and cord tighteners, figs. 1688-96, being practically obsolete.

Window-shade leather. 28, figs. 680-1. See above.

Window-shade tassel. 33, figs. 694-5. An unusual style of finishing the bottoms of window-shades.

Window-sill. 77-78, figs. 175-6, 180; 5, figs. 692-4. A horizontal piece of wood or sometimes cast-iron under a window, on which the sashes rest when down. There are usually two, *inside* and *outside*. A thin strip called the *window-sill cap* goes above it.

Window-sill cap. 79, figs. 175-6. See above.

Window-sill moulding. 80, figs. 175-6. A small wooden molding under an inside window-sill. In modern cars it is usually a *belt-moulding*, as 80, figs. 179-80.

Window-spring. Figs. 1648-51. See *Sash-spring*. *Spring-sash-holder*.

Window-stile. 11, figs. 692-5; 66, figs. 1848-4. The upright bars of a window-sash.

Window-stop. 84, 86', figs. 175, 180; 51, figs. 848-4. The strips, or *beads*, attached to the window-posts which hold the sashes in place. There are always two, *inside* and *outside*, and *parting-beads* or *sash-parting strips* in between.

Window-stop (inside). 7, fig. 694-5. See *Window-casing*.

Window ventilator. See *Deflector*. *Ventilator*.

Wind scoop. Figs. 1526-33, 1092-4, etc. A hood or ventilating-jack (often so called), attached to a pipe passing through the roof of a car, and so formed as to create either an exhaust draft or the contrary by the current of external air passing over the car. In the Gouge heater similar parts of somewhat more elaborate construction are called the *injector* and *exhausting weather cap*.

Wings (pile-driver car). 20, figs. 1821-4. See *Pile-driver car* and *swinging-platform*.

Winalow car-roof. Figs. 670-5. A car-roof, patented by A. P. Winslow, which consists of metal *roof-sheets* laid cross-wise to the car. They are made with corrugations and are let into grooves in the rafters. The latter are covered with strips of sheet-iron and the whole with a layer of transverse boards, which are fastened to longitudinal purlins attached to the rafters or carlines. See *Car-roof*.

Winalow car stove. Figs. 1533-7. A stove invented by A. P. Winslow, the peculiarity of which is that the base consists of a *safety-tank* which is connected by *safety-flues* to the fire-pot, so as to extinguish the fire in case of overturning. A wind-scoop and cold-air pipe are

heavy kind of wood-screw, but is not so-called. It has a square instead of slotted head, as fig. 1868. See *Screw*. **Wood screw-thread.** A form of screw-thread used for screws which are intended to screw into wooden objects. It differs from a *metal* thread in having the spaces between the projections wider. This kind of thread is shown in fig. 1868.

Wool-packed spiral-spring. Figs. 2046-7. A practically obsolete spring once largely used in freight service. **Worm.** A helix like a screw-thread, for winding rope or chain upon. See *Brake-chain worm*.

Worn flat (car-wheels). Under the rules for the interchange of traffic this defect is defined to be irregular wear under fair usage, due to unequal hardness of the tread of the wheel, and to be carefully distinguished from *slid flat*, which is a defect produced by the slipping of the wheels from excessive brake-pressure. The rules provide that flats exceeding $2\frac{1}{4}$ in. in length or diameter are cause for rejection.

Wrecking car. Figs. 75-80, 144-53. Also called *tool-car* or *derrick-car*. Figs. 75 and 76 represent the most powerful type, being worked entirely by steam, and having sufficient capacity to lift a locomotive. Detail specifications will be found in the "Railroad Gazette" for August 1, 1884. Figs. 79-80 are the stronger and most approved form of hand-wrecking car. Figs. 77-78 is another and lighter form in very general use.

Wrench. A contrivance for screwing and unscrewing a nut. A *monkey-wrench*, figs. 1597-9, is one having various sizes. A *socket-wrench*, figs. 1597-9, is one having a cavity to receive a *square-end*. The house brake are *packing-nut* 311, and the dis-

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wheel is largely used in freight (goods) service in England, and in both freight and passenger service on the continent of Europe. It very rarely fails. See also *Kirtley double-spoke wheel. Wheel. Car-wheel.*

Wrought moulding, or fascia moulding (English). 122, figs. 205, 207. A moulding which is worked out of the solid on a horizontal or vertical part of the framing of a carriage body. See *Planted moulding.*

X

"X" car-roof. Fig. 650. A form of roof for some reason little used, except in smoking and other cheap cars, in which the carlines are, in form at least, independent rafters crossing each other under the upper deck in the form of an X. An "A" car-roof, which see, is a different type of the same general idea; also unusual.

Y

Yale lock. Figs. 1027-8. A form of lock so named from its inventor, which uses a flat key with an irregularly curved edge sliding into a cylinder which carries a number of pins, each cut into two parts, as tumblers. The edge of the key raises these tumblers to precisely the right height to bring the joint in them to the edge of the cylinder and permit revolution. The advantages of the lock are its conciseness and simplicity and the difficulty of taking an impression for making a false key. To still further increase this difficulty, a *corrugated key* has recently been introduced, and is shown in the engraving.

Yoke. 1. ("American" steam tender-brake.) 8, figs. 366-

7. A malleable iron guide for the cylinder brake-lever, fastened to the rear end of the cylinder by the *yoke-stud* and *nuts*.

2. (Car door lock.) F, fig. 1005. A part inclosing the double-armed dog of the spindle in such manner that the motion of the door-knob in either direction moves back the latch.

3. (Car trucks.) 103, fig. 1959, etc. A *spring-saddle*, which see.

4. (Raoul journal-box, which see.) Fig. 2014. A strap embracing the journal-box lid to take up the end thrust. The use of the yoke has recently been abandoned in favor of a sliding cap or lid moving vertically in grooves to open the box for oiling, but falling of its own gravity when oscillation or jarring begins, if by accident left up. **Yoke-lever (Janney coupler).** 9, figs. 542-554. The part connecting the *coupler* and the *buffers* of the draw-gear, by means of which the co-operation of coupler and buffers is secured.

Z

Zenith lamp-burner. Fig. 900. One of the no-chimney burners. See *Lamp-burner.*

Zimmerman refrigerator car. The old style has its ice-box at the top of the car extending its full length and no circulation of air. The *Zimmerman improved* car is fitted with ice-boxes in the ends of the car through which run a number of flues which are intended to start a circulation of air and increase the cooling surface of the car.

TO ENGRAVINGS.

All alphabetically arranged under the following general heads ; the six general headings in-
cluding under them the great bulk of the engravings, which are again sub-classified alpha-

PAGE.	CUT No.		PAGE.	CUT No.
		Screw-threads..... (2 <i>pages</i> , 10 <i>cuts</i>)	294	1,825
2	1	Street Cars..... (4 " 30 ")	296	1,835
20	82	Sundries (1 " 33 ")	300	1,865
96	215	Trucks, Baggage and Freight,		
188	696	(1 " 9 ")	301	1,898
284	1,708	TRUCKS, for Cars (23 " 67 ")	302	1,907
289	1,727	TRUCK DETAILS..... (33 " 207 ")	325	1,974
292	1,821	Trusses, (1 " 8 ")	358	2,181
			357	2,188

There will be no difficulty in turning at once to any given engraving or class of engravings
by title and sub-title, as shown in part above and more fully in the following detailed index.
In the following list, the engravings are in general arranged alphabetically, according to the
order in which they are to be engraved.

PAGE.	CUT No.		PAGE.	CUT No.
-------	---------	--	-------	---------

FURNISHINGS, Continued.	PAGE.	CUT NO.
Stoves and Heaters, Johnson	258	1,473
" <i>Miscellaneous</i>	259	1,473
" <i>Ranges and Cook-</i>		
<i>stoves</i>	260	1,480
" <i>Searle</i>	261	1,484
" <i>Spear</i>	262	1,486
" <i>Suspended Heater</i> ..	266	1,529
" <i>Winslow</i>	268	1,533
Table	270	1,588
Ventilators	271	1,553
Wash-room	273	1,570
Water-coolers, etc.	275	1,591
Window, for Deck Sashes	276	1,603
" <i>for Lower Windows</i> ..	280	1,646
HAND CARS, General Views	284	1,708
" <i>Details</i>	286	1,720
LOGGING CARS, General Views	289	1,727
" <i>Details</i>	290	1,731
PILE-DRIVER CAR	292	1,821
SCREW THREADS	294	1,835
STREET CARS, General Views	296	1,835
" <i>Details</i>	297	1,843
SUNDRIES	300	1,865
TRUCKS, Baggage and Freight	301	1,898
" <i>Freight-car, Diamond Type</i> ..	302	1,907
" " <i>Miscellaneous Types</i> ..	311	1,941
" <i>Passenger-car, Four-wheel</i>	316	1,954
" " <i>Six wheel</i>	323	1,969
TRUCK DETAILS, Axles	325	1,974
" <i>Brake-Shoes, etc</i> ..	326	1,977
" <i>Journal Bearings</i>	327	1,983
" <i>Journal Boxes</i>	329	1,997
" <i>Pedestals</i>	333	2,021
" <i>Side Frames, Side bear-</i>		
<i>ings, etc.</i>	334	2,025
" <i>Springs, Elliptic</i>	335	2,031
" " <i>Rubber, etc</i> ..	337	2,042
" " <i>Spiral</i>	338	2,049
" " <i>Spiral Gradu-</i>		
<i>ated</i>	345	2,095
" <i>Swing Links, etc</i>	347	2,107
" <i>Wheel and Axle</i>		
<i>Gauges</i>	348	2,114
" <i>Wheels, Cast</i>	349	2,124
" " <i>Steel-tired</i>	354	2,152
TRUSSES, Typical forms of	358	2,181

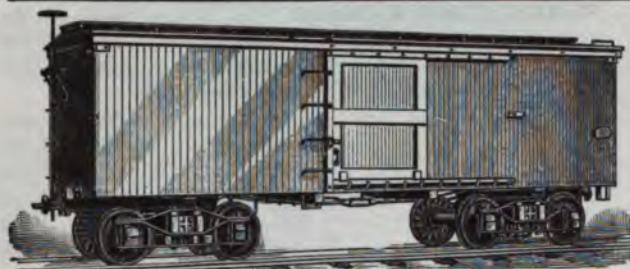


Fig. 1. BOX CAR, Eight-wheeled.



Fig. 2. BOX CAR, with END DOOR.



Fig. 3. BOX CAR, showing GRAIN DOOR.



Fig. 4. BOX CAR, Four-wheeled.
(Little used; the same type is built with inside sheathing only, leaving framing exposed.)



Fig. 5. STOCK CAR.
("BASTARD HOWE" Framing), old style, but much in use.



Fig. 6. STOCK CAR.
Standard of Pennsylvania Railroad and allied lines ("PRATT-TRUSS" Framing).

Double-Deck Stock-Cars, shown in Figs. 132-138.



Fig. 7. STOCK CAR. ("BASTARD HOWE" Framing.)

See also Figs. 27-42, giving dimensions of these types.



Fig. 8.
BOX STOCK CAR OR HORSE CAR (little used).



Fig. 9.
BOX STOCK CAR (little used).
1. Ladder Sides. 2. Ladder Rounds.



Fig. 10.
MILK CAR.



Fig. 11
REFRIGERATOR CAR.
(Old style; engraving imperfect as respects ice-box below the roof.)



Fig. 12.
REFRIGERATOR CAR (modern).
(One of many types. See Dictionary, REFRIGERATOR CAR.)



Fig. 13.
FLAT CAR.
1. Stake-pocket.

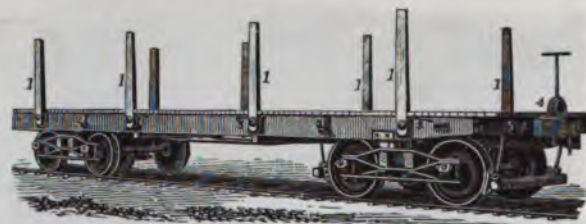


Fig. 14.
FLAT CAR, with STAKES.
1. Stake. 2. Stake-rest. 3. Stake-hook.



Fig. 15.
GONDOLA CAR.
1. Stake-pocket.



Fig. 16.
HOPPER-BOTTOM GONDOLA CAR.



Fig. 17.
COKE CAR.

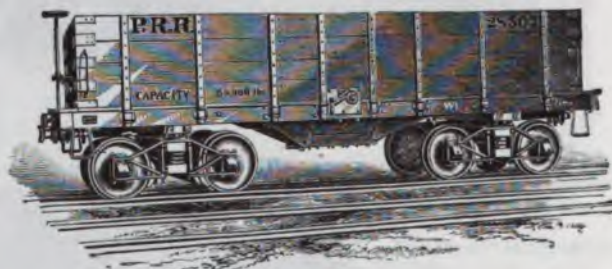


Fig. 18.
HOPPER-BOTTOM GONDOLA CAR.
(Modern type, 25 tons capacity.)

See also Figs. 29-42,
giving dimensions of these types.



Fig. 19.
FOUR-WHEELED GONDOLA CAR.



Fig. 20.

HOPPER-BOTTOM COAL CAR, *Eight-wheeled.**(For details of modern car of this design, see Figs. 109-112.)*

Fig. 21.

IRON-HOPPER COAL CAR.



Fig. 22.

TANK CAR OR OIL CAR.

*(For details, see Figs. 139-142.)*Usual capacity 3,700 to 3,850 gallons,
weighing 7.3 lbs. per gallon.

Fig. 23.

FOUR-WHEELED HOPPER-BOTTOM COAL CAR.

(For details, see Figs. 105-108.)

Fig. 24.

FOUR-WHEELED TIP CAR.

(For details, see Fig. 143.)

Fig. 25.

EIGHT-WHEELED TIP CAR.

PENNSYLVANIA RAILROAD.

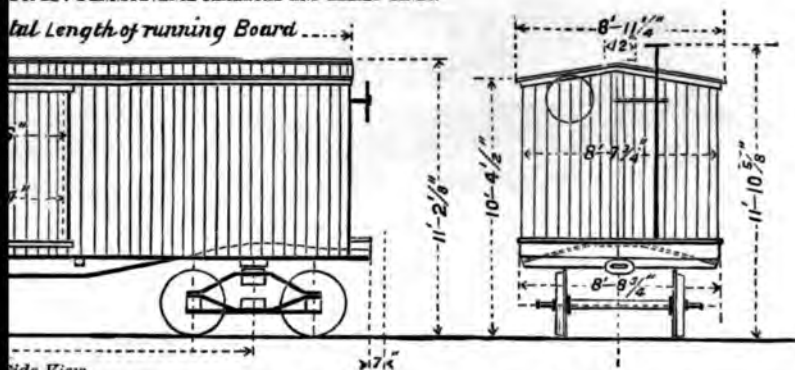
(See Figs. 39-40 for dimensions; other designs of eight-wheeled tip cars are also built.)

Fig. 26.

MINE CAR.

TYPES : PENNSYLVANIA RAILROAD AND ALLIED LINES.

Total Length of running Board



Side View.

and much larger standard shown in Fig. 43.)

Fig. 28, End View.

00 lbs. Length of frame, 29' 10 3/4". 31' 0 3/4" from face to face of drawbar.

th of body



STANDARD TYPES: PENNSYLVANIA RAILROAD AND ALLIED LINES.

(A newer and larger design for this style of car is shown in Figs. 136-138.)

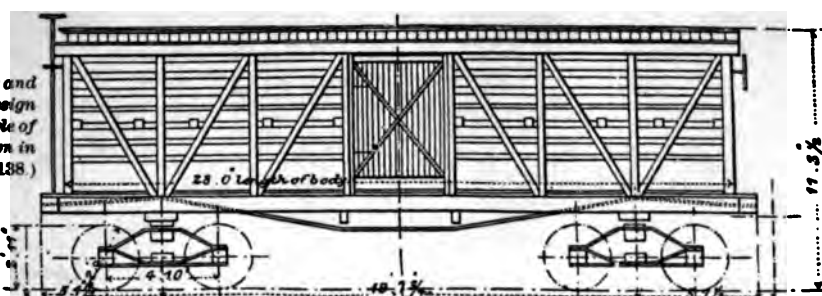


Fig. 33. STOCK CAR, with DOUBLE DECK. Weight, 21,000 lbs. Capacity, 22,400 lbs. Length of frame, 29' 10 1/4". 31' 0 3/4" from face to face of drawbar.

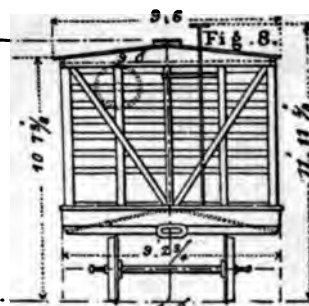


Fig. 34. End View.

(Cars of greater capacity of this general design are also built.)

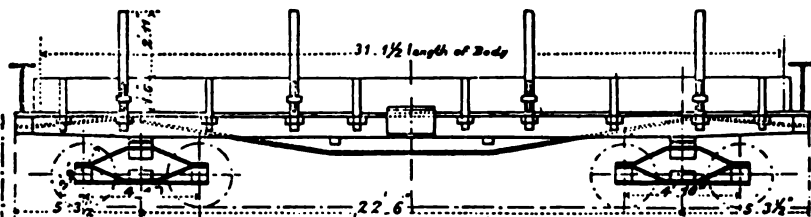


Fig. 35. GONDOLA OR PLATFORM CAR. Weight, 17,280 lbs. Capacity, 30,000 lbs. Length of frame, 33' 1'. 34' 3" from face to face of drawbar. 30' 9 1/4" inside in the clear.

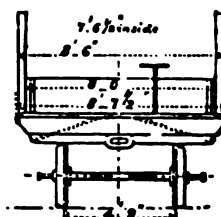


Fig. 36. End View.

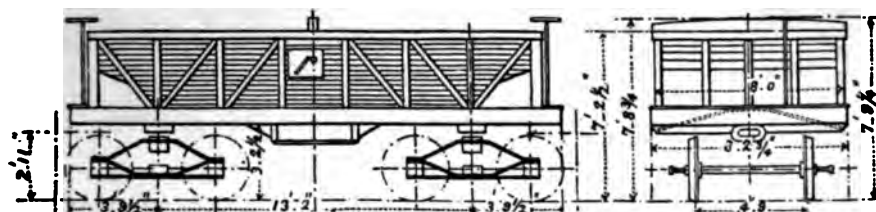


Fig. 37. COAL CAR. Weight, 16,000 lbs. Capacity, 28,000 lbs. Length of frame, 20' 9". 21' 11" from face to face of drawbar.

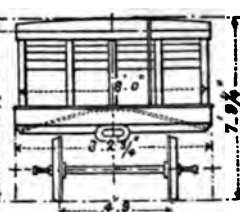


Fig. 38.

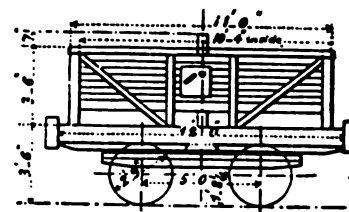


Fig. 41. ANTHRACITE COAL CAR. Weight, 7,600 to 7,900 lbs. Capacity, 13,000 lbs.

(Mainly used for grading and construction purposes, and not for coal.)

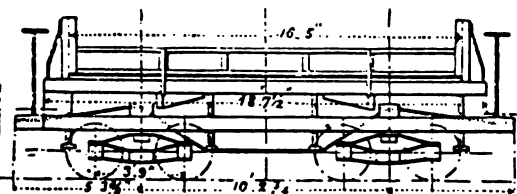


Fig. 39. GRAVEL CAR OR TIP CAR. Weight, 13,000 lbs. Capacity, 16,000 lbs. Length of frame, 20' 9 1/4". 21' 11 1/4" from face to face of drawbar.

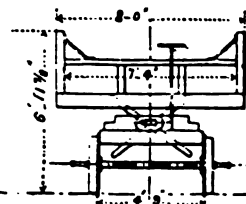


Fig. 40. End View.

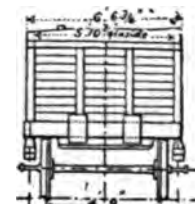
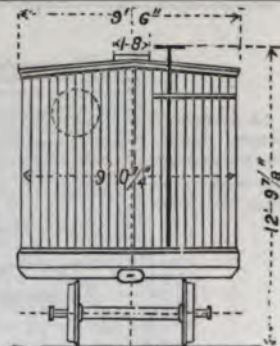
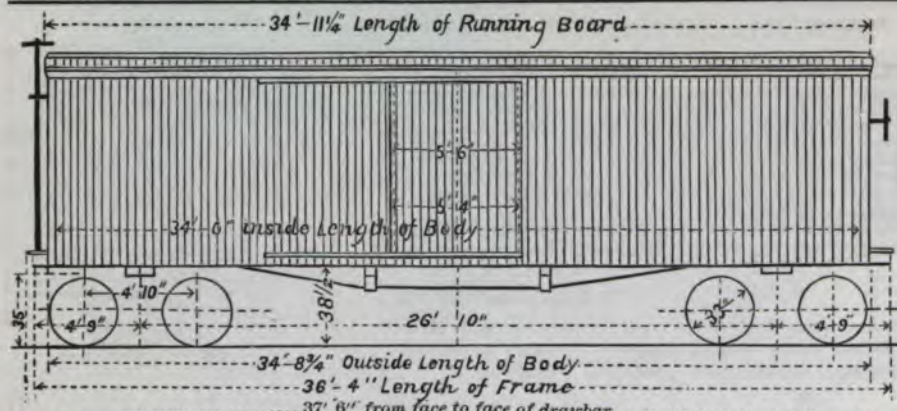


Fig. 42. End View.



Weight, 24,800 lbs.
Capacity, 50,000 lbs.

Fig. 43. Box Car (New Standard). PENNSYLVANIA RAILROAD.

(A similar diagram of the New York, West Shore & Buffalo Box Car is shown in Fig. 98.)



Fig. 44. CABOOSE CAR with LOOKOUT.

(LOOKOUTS are in increasing use, but the majority of caboose cars do not have them.)



Fig. 45. FOUR-WHEELED CABOOSE CAR OR CABIN CAR, with LOOKOUT.

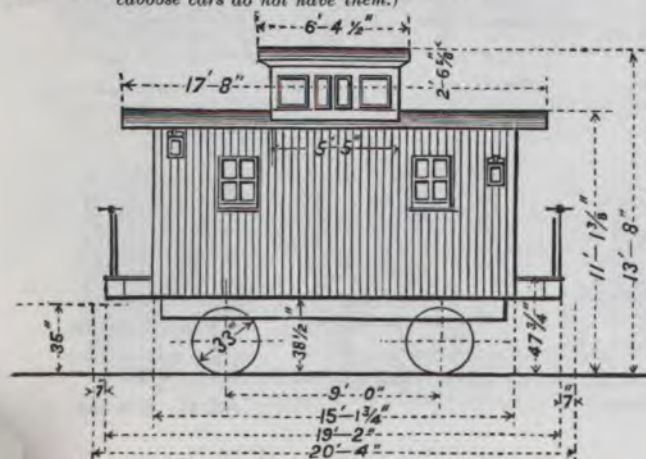


Fig. 46. Side Elevation of Fig. 45.

(Standard of Pennsylvania Railroad and allied lines. The old standard type of this car is shown in Fig. 104 1/2, with detail drawings, Figs. 102-4.)



Fig. 47. End Elevation of Fig. 45.



Fig. 48. PASSENGER CAR OR COACH, Pennsylvania Railroad and allied lines.
(Side view to larger scale with brake attachments in Figs. 324-325; general dimensions in Figs. 62-63; also shown in detail under CAR-BODIES, PASSENGER; CAR-BODY DETAILS and FURNISHINGS.)



Fig. 49. PASSENGER CAR OR COACH.
(Old style, especially in respect to style of decoration, height of steps from the track, name-panel and curved window-casings.)



Fig. 49½. SUBURBAN EXCURSION CAR.
(The more usual practice with these cars is to use canvas side-curtains instead of blinds.)



Fig. 50.
MANY "BOUDOIR" SLEEPING CAR, with ARCHED ROOF.
(For floor plan of this car, see Fig. 213.)



Fig. 51.
COMBINATION COACH.
(Combined Passenger and Baggage Car.)
(Old style, in respect to the curved tops to the windows and doors, and the oval name-panel.)



Fig. 52.

DRAWING-ROOM CAR OR PARLOR CAR.



Fig. 53.

CHAIR CAR OR PARLOR CAR.

(This car is shown in detail in Figs. 159-'60.)



Fig. 54.
SLEEPING AND HOTEL CAR.
(Old style in respect to window details and decorations.)



Fig. 55.
SLEEPING CAR.
(Modern style of finish and decoration.)



Fig. 56.
DINING CAR.
(Usually fitted with THEATRE SEATS for ease in going to and from the tables.)
(Old style in respect to windows and sub-divisions. For newer designs see Figs. 191-194 and 214.)

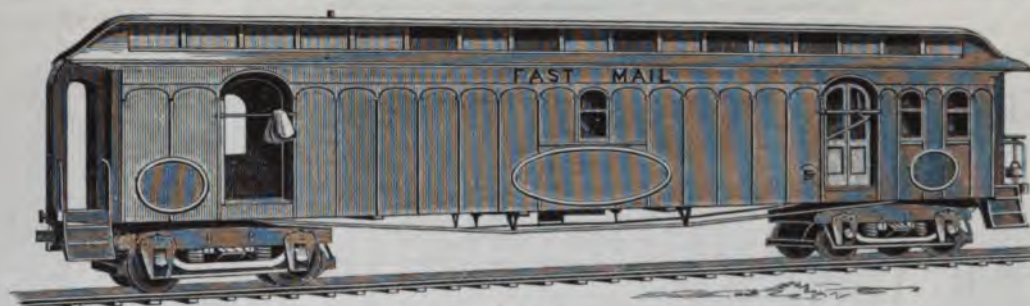


Fig. 57.

MAIL CAR OR POSTAL CAR.

(Old style in respect to curved paneling, although largely in use. For newer style, with dimensions, see Figs. 64-65.)

Fig. 58.

COMBINATION BAGGAGE CAR.

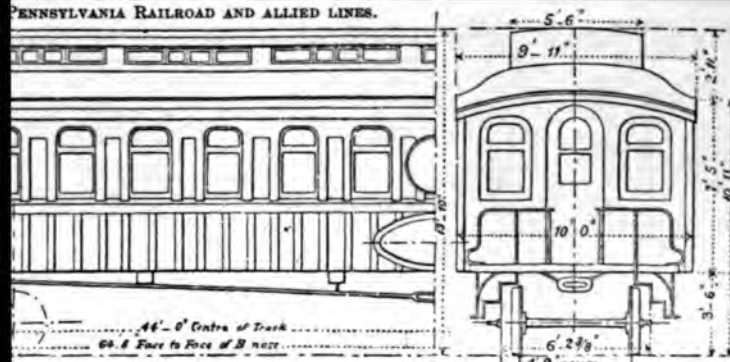
(Combined Baggage and Express or Mail Car.)

Fig. 59.

BAGGAGE OR EXPRESS CAR.

(Figs. 58 and 59 are not of the most approved modern design, although largely in use. Figs. 64-65 more correctly represent current practice.)

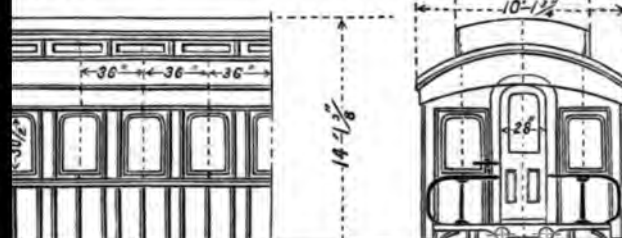
PENNSYLVANIA RAILROAD AND ALLIED LINES.



ING CAR. Side View.

(Sleeping car are also in use.)

Fig. 61. End View.



(For side view, see Fig. 48 or, to larger scale, Figs. 324-325. Also shown in detail under CAR-BODIES, PASSENGER; CAR-

STANDARD TYPES: PENNSYLVANIA RAILROAD AND ALLIED LINES.

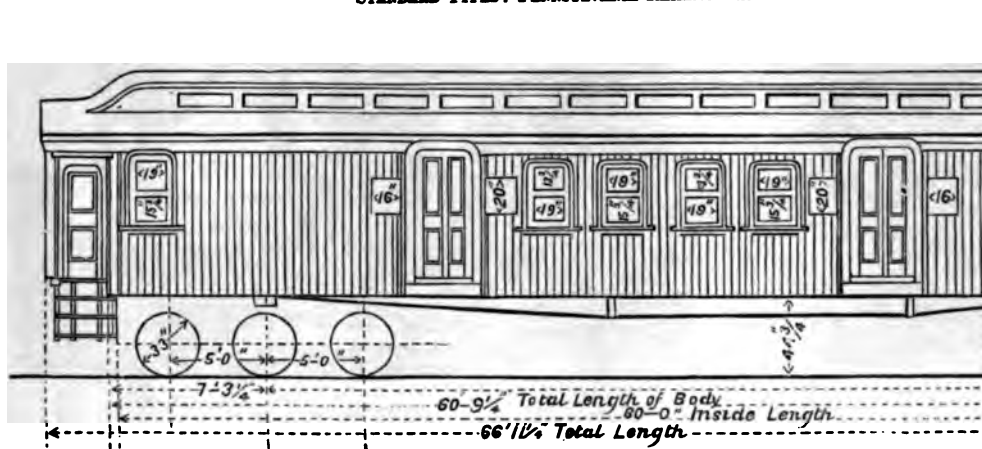


Fig. 66. Side View.

POSTAL OR MAIL CAR.

Weight, 58,000 lbs. Capacity, 10 tons.

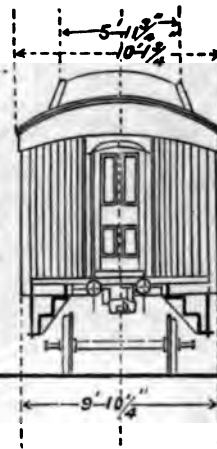


Fig. 67. End View.

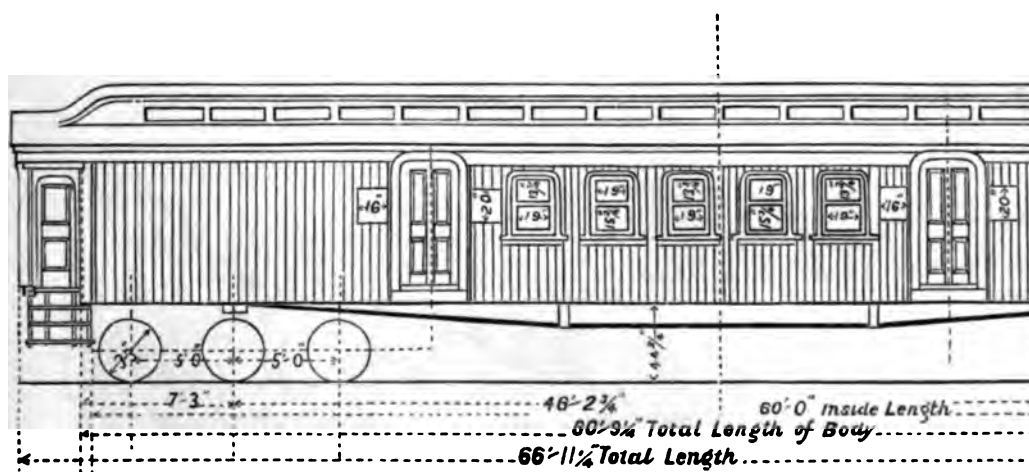


Fig. 68. Side View.

POSTAL OR MAIL CAR.

Weight, 56,700 lbs.

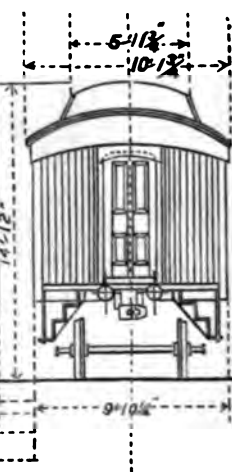


Fig. 69. End View.



Fig. 70.
SWEEPING CAR.
A. Snow-scraper.



Fig. 71.
DITCHING CAR.



Fig. 72.
FERRY PUSH-CAR.

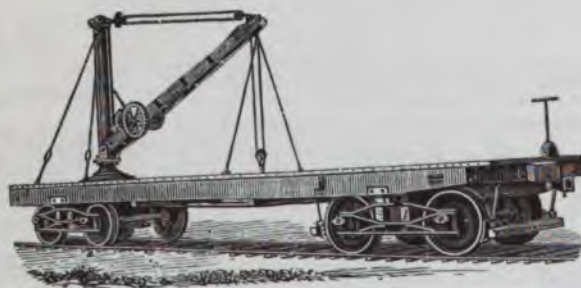


Fig. 73.
DERRICK CAR OR WRECKING CAR.

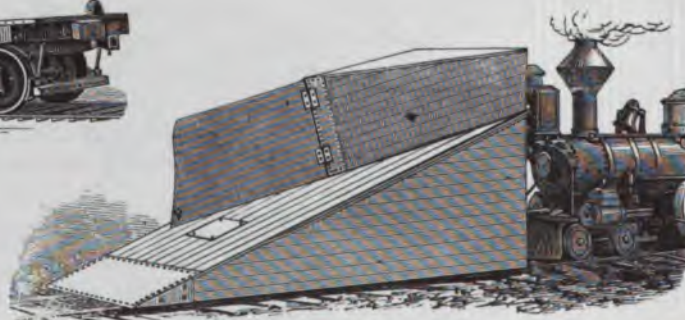


Fig. 74.
SNOW-PLOW.

(Another style is shown in Fig. 81; see also SNOW-PLOW in Dictionary.)

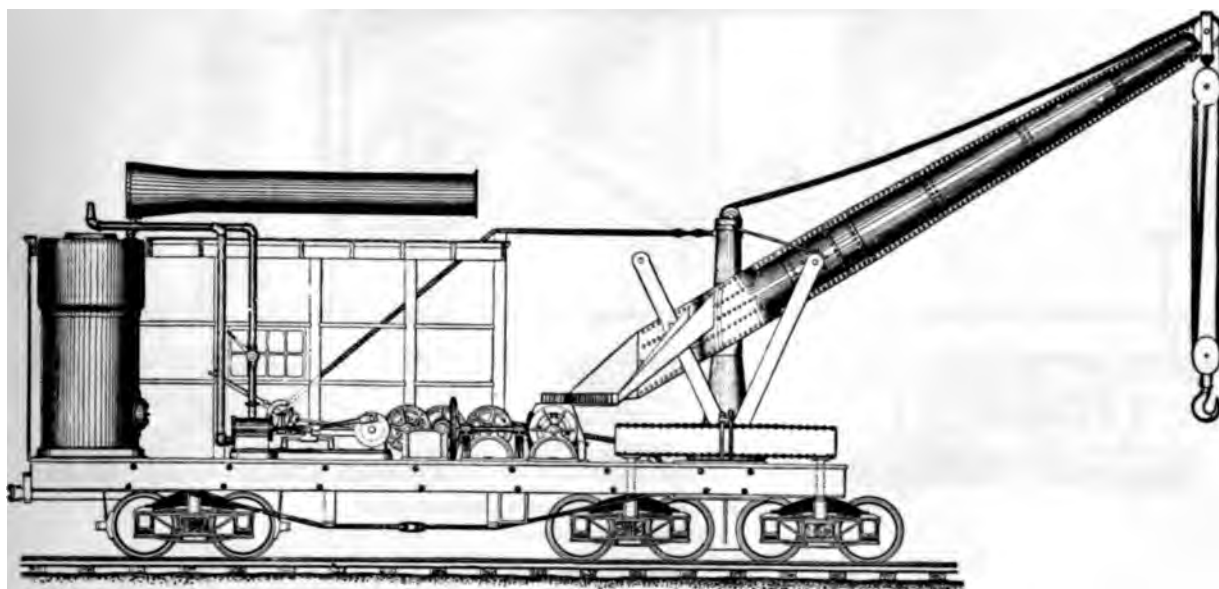


Fig. 75. Side View.
(Scale 8 ft. to the inch.)

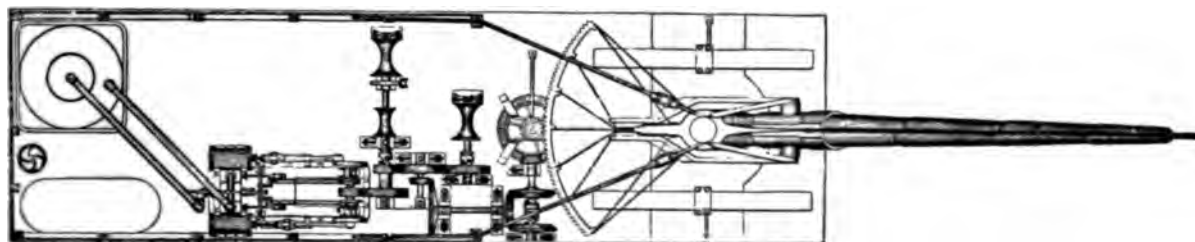


Fig. 76. Plan.

STEAM WRECKING OR DERRICK CAR :
MICHIGAN CENTRAL, ATCHISON, TOPEKA & SANTA FE and CHICAGO & WESTERN INDIANA RAILROADS
Radius of Boom, 22 ft. Capacity of TANK, 450 gals.
(Names of the principal details are approximately given in Figs. 77-79.)

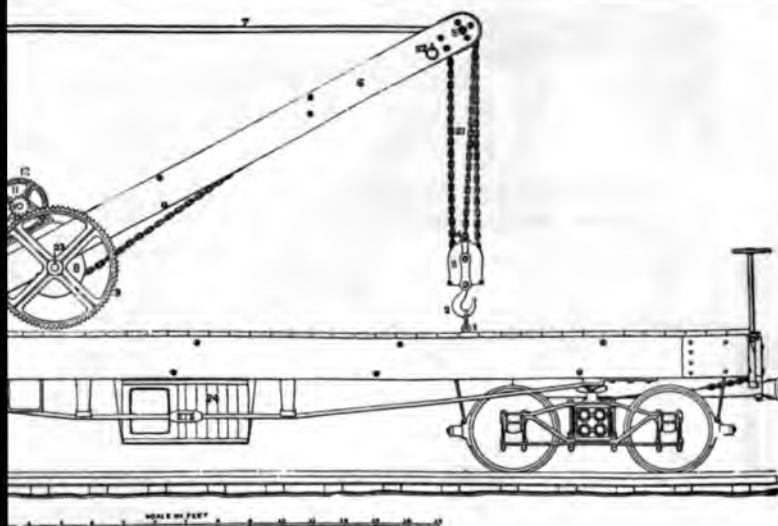


Fig. 77. Elevation,
HAND DERRICK OR WRECKING CAR.

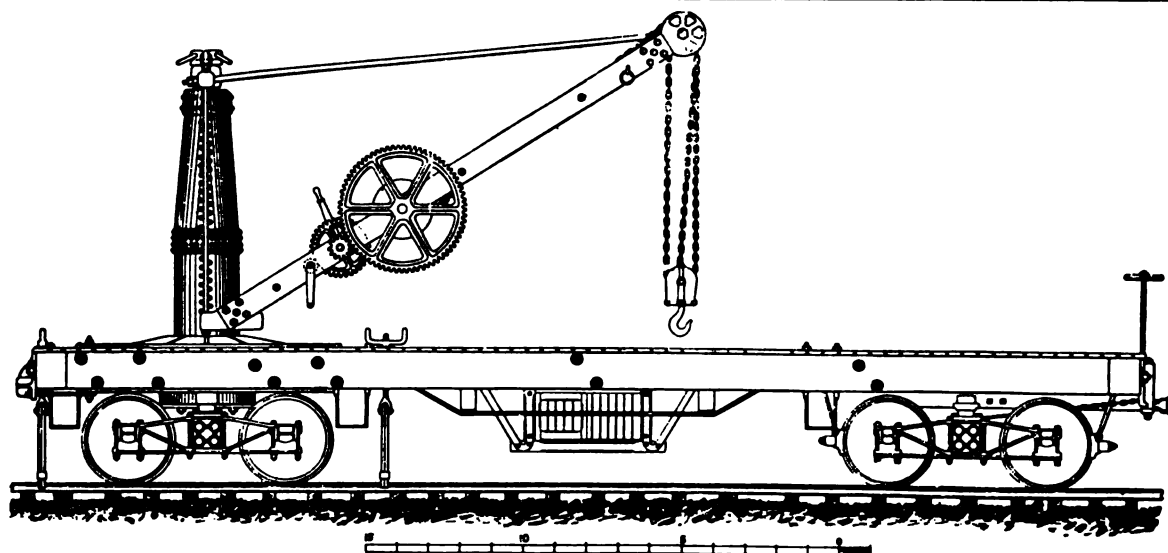


Fig. 80. Side Elevation.
HAND WRECKING OR DERRICK CAR, 10 TON CRANE.
(Another style of Wrecking Car is shown in Figs. 144-153.)

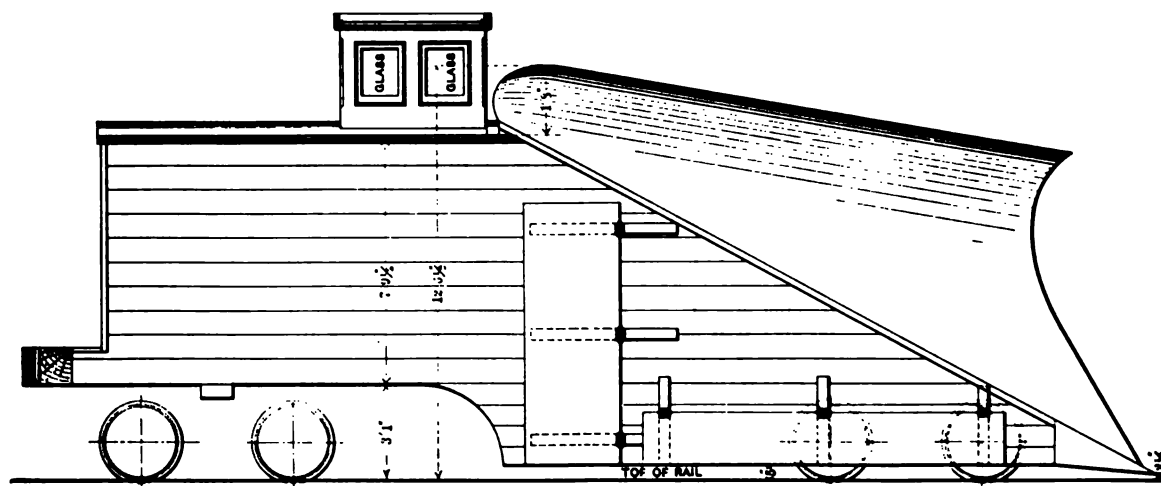


Fig. 81. SNOW-FLOW.
NEW YORK, WEST SHORE & BUFFALO RAILWAY.
(Another style is shown in Fig. 74; see also SNOW-FLOW, in Dictionary.)

to List of Names of Parts with Figs. 95-96.

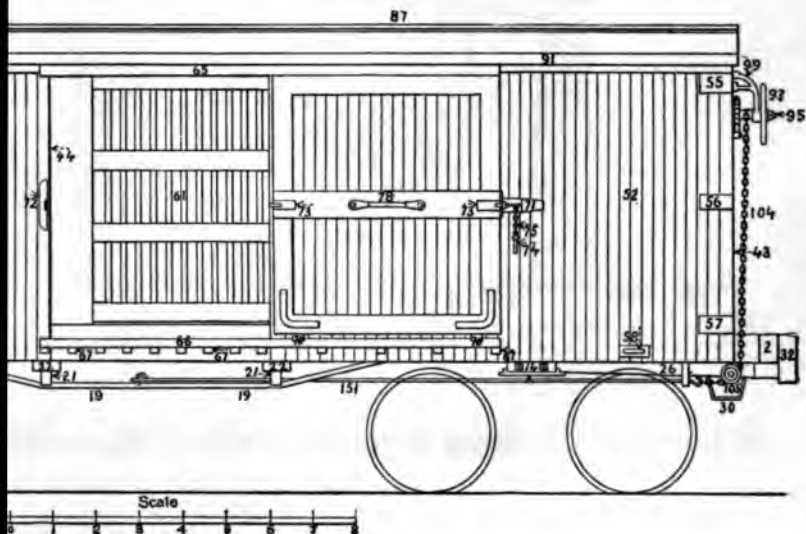
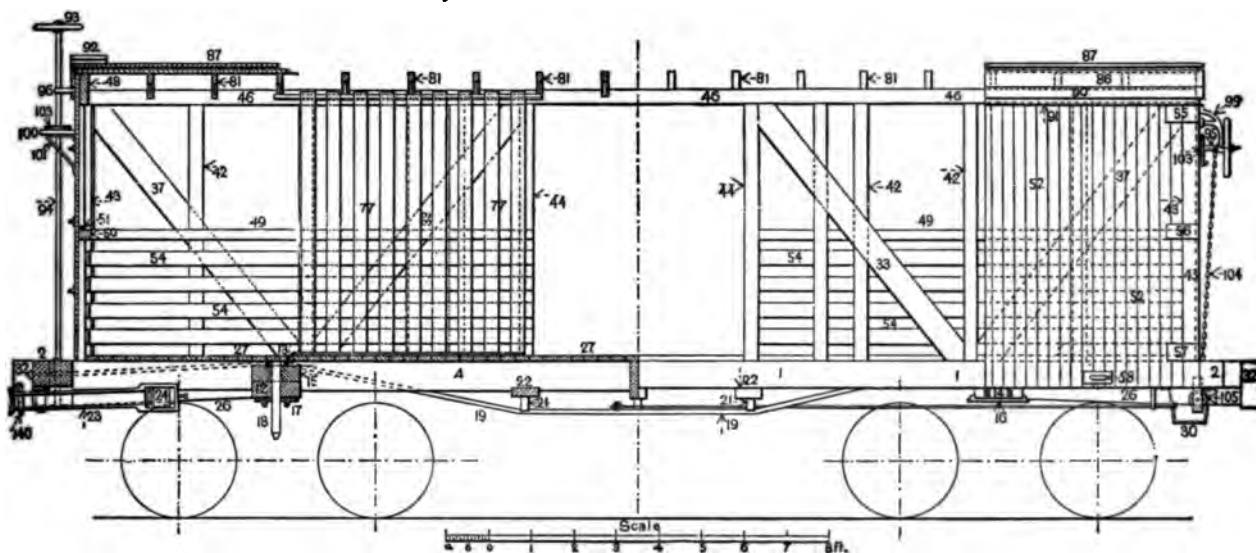


Fig. 82. Side View.

Numbers refer to List of Names of Parts with Figs. 95-96.



Longitudinal Section.

Fig. 84.

Outside View, showing Framing.

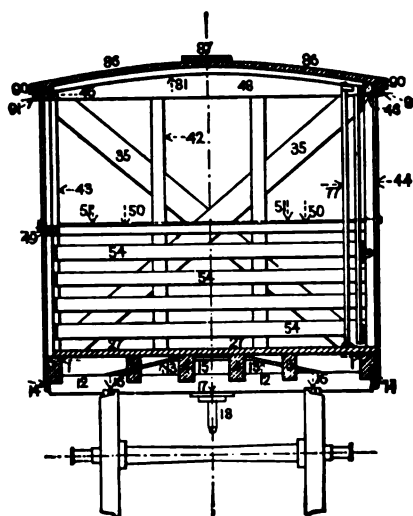


Fig. 85. Transverse Section.

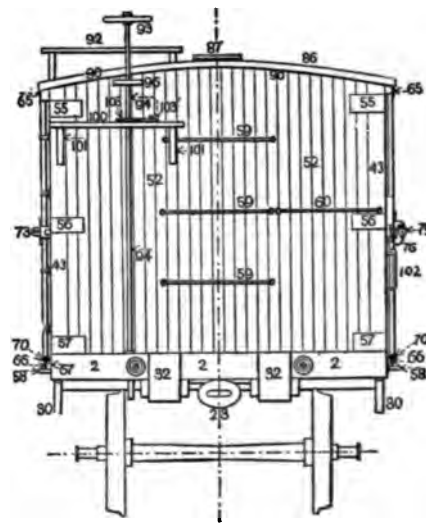


Fig. 86. End View.

BOX-CAR BODY, CENTRAL RAILROAD OF NEW JERSEY.

of Names of Parts with Figs. 95-96.

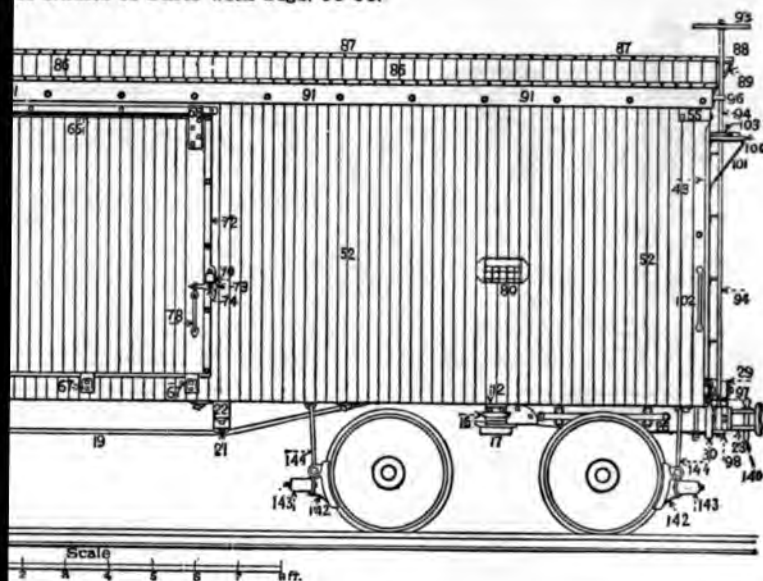


Fig. 87. Side View.

Numbers refer to List of Names of Parts with Figs. 95-96.

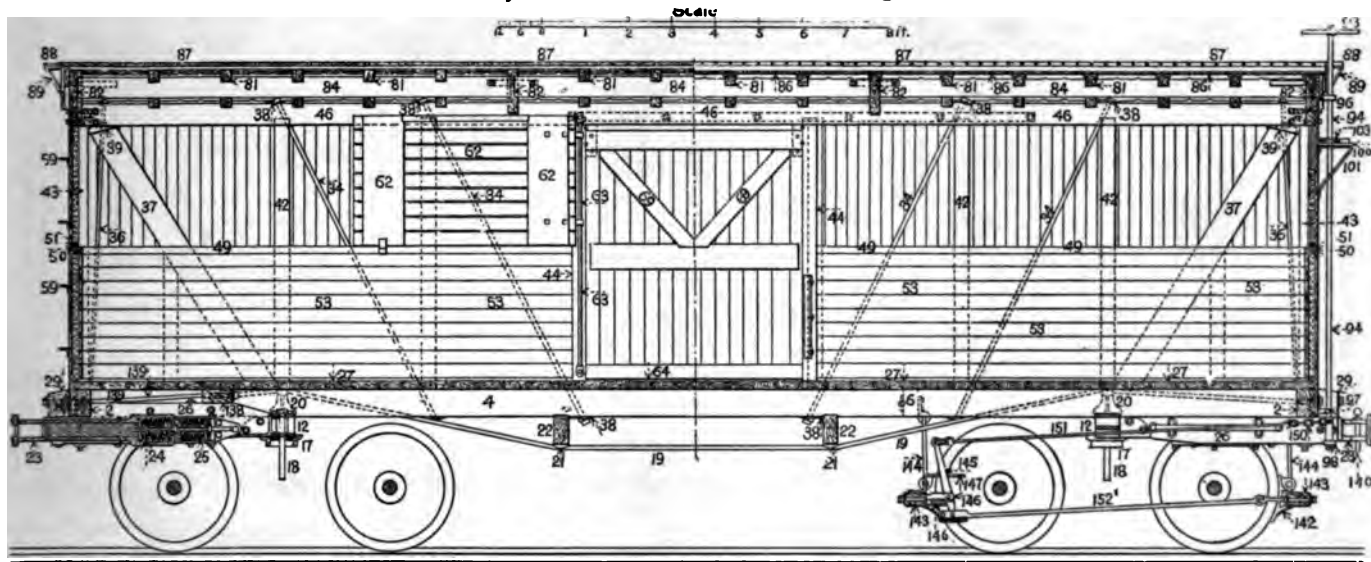


Fig. 89. Longitudinal Section.

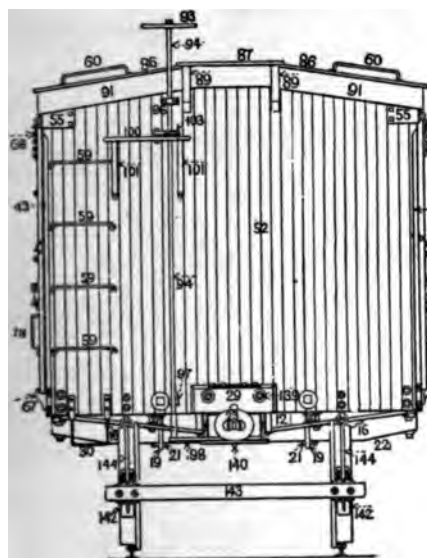
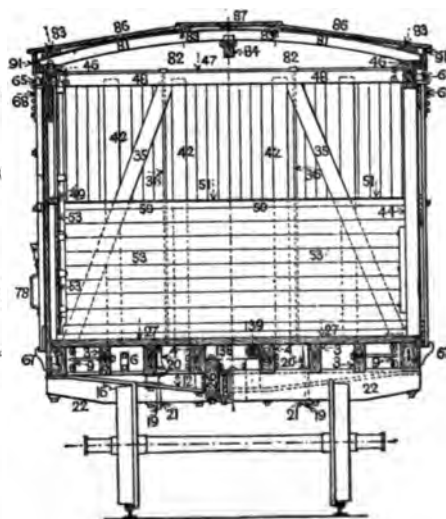
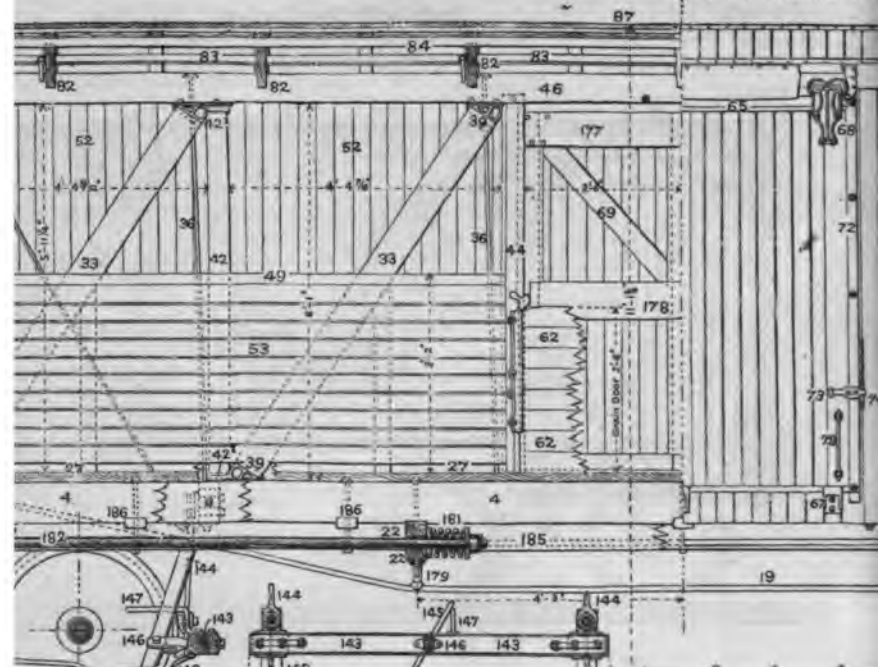


Fig. 90.
End View.

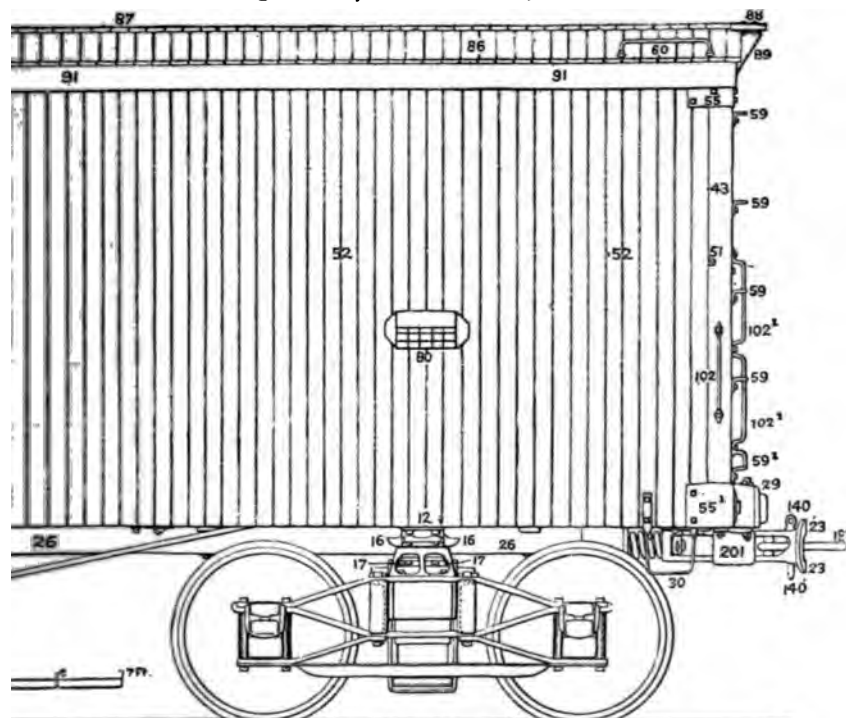




CAR-BODIES, Freight; Box Cars.

Figs. 93-94

Names of Parts with Figs. 95-98: 175 and over refer to List on following page.



End Sit to Centre of Car 17 Feet

Line of Body Baulter is Centre of Cross-Frame-Tie-Timber 7'-11" --- Inside of Side Sill to Centre of Body Baulter 4'-5".

Plan of Floor Timbers.

- Draft Timber - 10' - 3 1/4" -

STANDARD BOX CAR, NEW YORK CENTRAL & HUDSON RIVER RAILROAD AND ALLIED LINES.

(Figs. 93-96).

with HOIT DRAW-GEAR (Figs. 426-427)
and BRAKE-SHAFT GEAR of Figs.
252-254.

Capacity..... 40,000 lbs.
Weight..... ——— lbs.

Weights in Detail.

Wrought iron in car-body.	2,552	lbs.
Cast " "	797	"
Steel " "	104	"
Malleable " "	13½	"

Wrought iron in trucks, including axles.....	3,144	"
Cast iron in trucks, including wheels.....	5,386	"
Malleable iron in trucks..	48	"
Journal bearings	80	"

SPECIFICATIONS.

Axles: Hammered iron, "M. C. B. standard."

Wheels: 525 lbs. each, and guaranteed for three years. Pressed upon axles at a pressure not less than 60,000 lbs.

Springs: N. & A. Middleton's
twenty-ton holster.

Card-cases: Two metal card-cases, 12 x 8½ in. inside, with wire rack, and strip of rubber over top to keep off the rain, blocked out on washers ¼ in. for circulation of air.

Bolts and Nuts: All bolt-heads and nuts to be let in flush on inside of car and all sharp corners removed.

Painting: Car-body, three coats mineral paint. Iron-work exposed to view, one coat of gloss black. Trucks, two coats of mineral paint. Roof, top of floor timbers, outside and top of sills, and all mortises and tenons, one coat mineral paint.

Weights: To be marked on the right-hand lower corner of both sides of car, and over the weight the words and figures. "500 lbs."

Screen-Play

Plan of Floor.

LIST OF NAMES OF PARTS OF BOX-CAR BODIES; Figs. 82-101.

- | | | | |
|---|------------------------------|--|------------------------------------|
| 1. Side-sill. | 32. Dead-blocks. | 60. Roof Grab-iron. | 93. Brake-wheel. |
| 2. End-sill. | 32'. Buffer-beam. | 61. Grated-door. | 94. Brake-shaft. |
| 3. Intermediate-sills. | 33. Side Body-brace. | 62. Grain-door. | 95. Horizontal Brake-shaft. |
| 4. Centre-sills. | 34. Side Body-brace Rod. | 63. Grain-door Rod. | 96. Upper Brake-shaft Bearing. |
| 5. Short Floor-timber. | 34'. End Body-brace Rod. | 64. Door-sill. | 97. Lower Brake-shaft Bearing. |
| 6. Brake hanger Timber. | 35. End Body-brace. | 65. Top Door-track. | 98. Brake-shaft Step. |
| 7. Floor-timber Distance-block. | 35'. End Body-brace Pocket. | 66. Bottom Door-track. | 99. Brake-shaft Bracket. |
| 8. Floor-timber Braces. | 36. Sill-and-plate Rod. | 67. Door-track Bracket. | 100. Brake-step. |
| 9. Sill Knee-iron. | 37. Body Counterbrace. | 68. Door-hanger. | 101. Brake-step Bracket. |
| 10. Sill Tie-rod. | 37'. Body Counterbrace Rod. | 69. Door-brace. | 102. Corner Grab-iron. |
| 11. Transverse Floor-timbers. | 38. Brace-rod Washer. | 70. Door-shoe. | 102'. End Grab-iron. |
| 12. Body-bolster. | 39. Brace-pocket. | 71. Open-door Stop. | 103. Brake Ratchet-wheel. |
| 12'. Body-bolster Spacing-block. | 40. Right-hand Brace-pocket. | 72. Closed-door Stop. | 103'. Brake-pawl. |
| 13. Body-bolster Truss-rod. | 41. Double Brace-pocket. | 73. Door-hasp. | 104. Horizontal Brake-shaft Chain. |
| 14. Body-bolster Truss-rod Washer. | 42. Body-post. | 74. Door-pin. | 105. Brake-shaft-chain Sheave. |
| 15. Body-bolster Truss-block. | 42'. Body-post Pocket. | 75. Door-pin Chain. | 138. Drawbar Cross-timber. |
| 16. Body Side-bearing. | 43. Corner-post. | 76. Lock-chain. | 139. Draw-gear Tie-rod. |
| 17. Body Centre-plate. | 44. Door-post. | 77. Door-guards. | 140. Coupling-pin. |
| 18. King-bolt, or Centre-pin. | 44'. Door-post Pocket. | 78. Door-handle. | 141. Train Signal-lamp. |
| 19. Body Truss-rod. | 45. Corner-post pocket. | 79. Freight-car Lock. | 142. Brake-head. |
| 20. Body Truss-rod Saddle. | 46. Plate. | 80. Card-rack. | 143. Brake-beam. |
| 21. Body Truss-rod Bearing. | 47. Plate-rod. | 81. Carline, or Curling. | 144. Brake-hanger. |
| 22. Needle-beam, or Cross-frame Tie-timber. | 48. End-plate. | 82. Main-carline. | 145. Brake-lever. |
| 23. Drawbar. | 49. Girth. | 83. Purlin (see note to Figs. 97-101). | 146. Brake-lever Fulcrum. |
| 24. Draw-spring. | 50. End-girth. | 84. Ridge-pole. | 147. Brake lever Guide. |
| 25. Auxiliary Buffer-spring. | 51. End-girth Tie-rod. | 85. Roof-braces. | 148. Brake-lever Bracket |
| 26. Draw-timbers. | 52. Sheathing, or Siding. | 86. Roof-boards. | 150. Brake-shaft Chain. |
| 27. Floor. | 53. Inside-lining. | 87. Running-board. | 151. Brake-shaft Connecting-rod. |
| 28. Double Deck. | 54. Lining-strips. | 88. Running-board Extension. | 152'. Lower Brake-rod. |
| 29. Buffer-block. | 55. Upper Corner-plate. | 89. Running-board Bracket. | 155. Journal-box. |
| 30. Sill-step. | 55' (Same as 57). | 90. Eaves-moulding. | |
| 31. Sill-step Stay. | 56. Middle Corner-plate. | 91. Eaves Fascia-board. | |
| | 57. Lower Corner-plate. | 92. Roof-step. | |
| | 58. Pull-iron. | | |
| | 59. Ladder-rounds. | | |
| | 59'. Bent Ladder-round. | | |

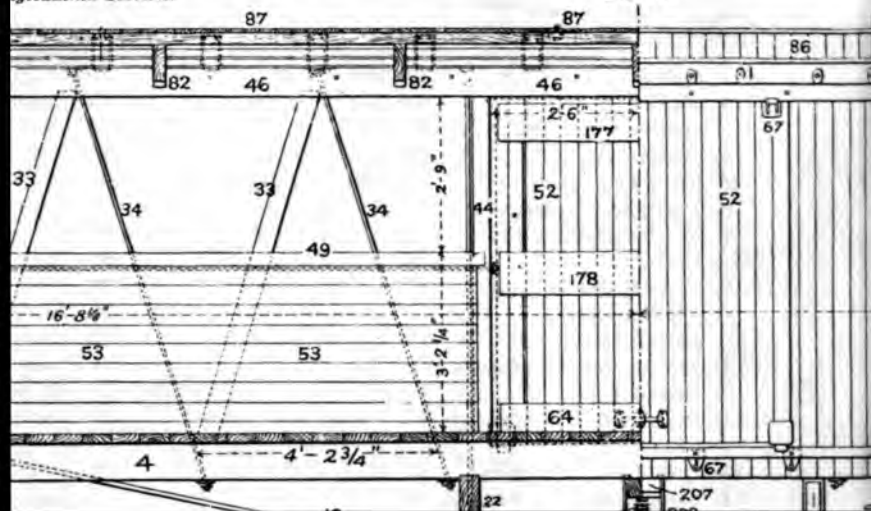
(Certain additions to this list, shown only in the special drawings referred to, are given with Figs. 95-96 (viz., Nos. 173 to 192, and No. 201); with Figs. 97-101 (viz., Nos. 203 to 209), and with Figs. 113-115 (viz., Nos. 194-200). Numbers omitted from the above list are used of parts special to other forms of freight cars than box cars, as per following lists.)

SCALE



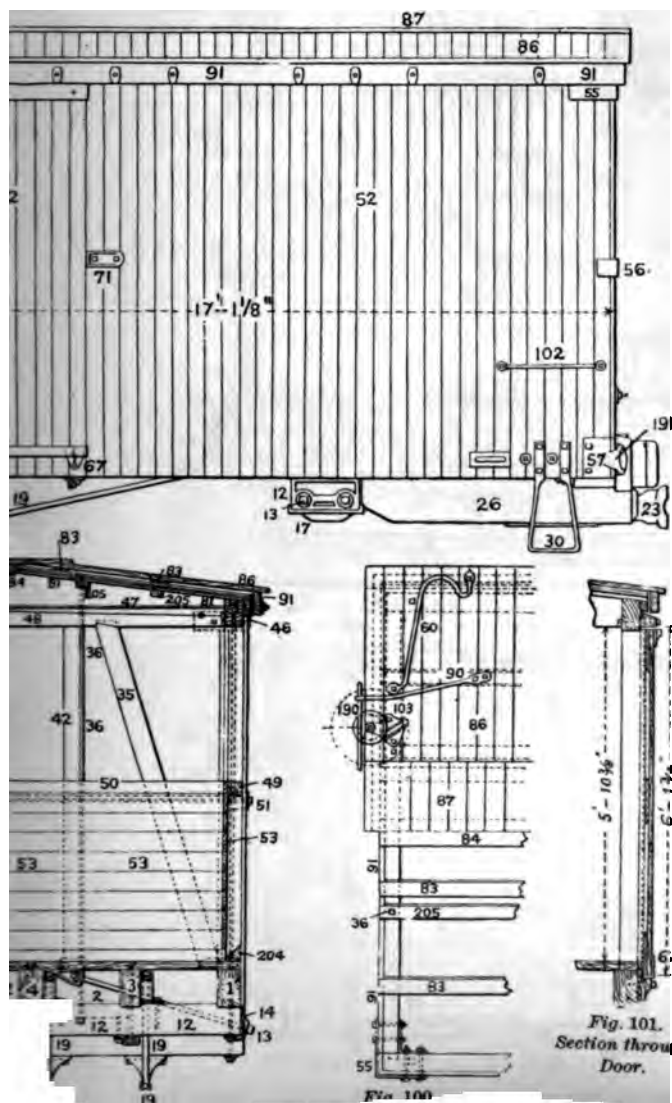
Longitudinal Section.

Fig. 97.



Numbers below 202 refer to List of Names of Parts on preceding page.

Side Elevation.

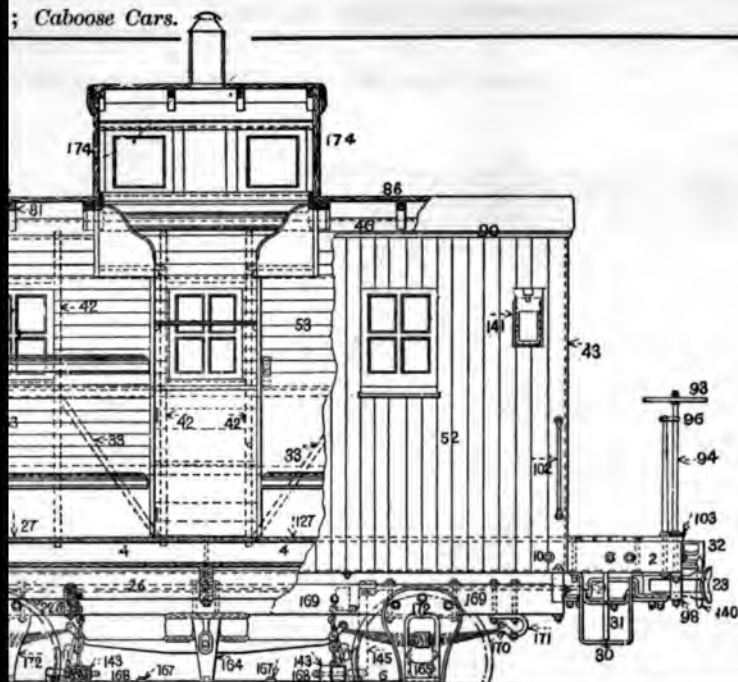


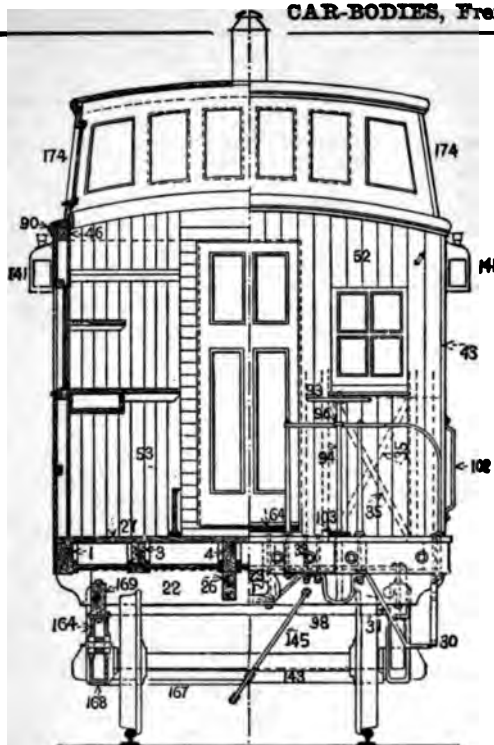
NAMES OF PARTS SPECIAL TO FIGS. 97-100
IN ADDITION TO GENERAL LIST ON PRE-
CEDING PAGE. FOR NUMBERS BELOW 202.

- 202. Ladder Side-rails.
- 203. Drawbar Strap.
- 204. Floor Blocking-strip.
- 205. Purlins.*
- 206. Pull-iron.
- 207. Brake-equalizer Block.
- 208. " Equalizer Strap.
- 209. " Equalizing-lever.

* The numbers 83 and 205 are reversed in these engravings—205 are the Purlins proper and 83, Roof-strips.

Fig. 101.
Section through
Door.





Transverse Section. Fig. 104. End View.

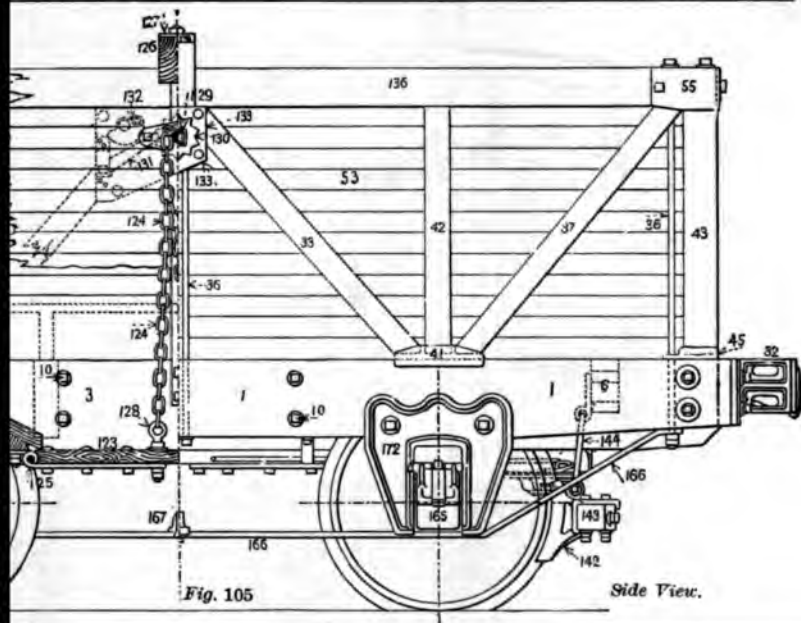


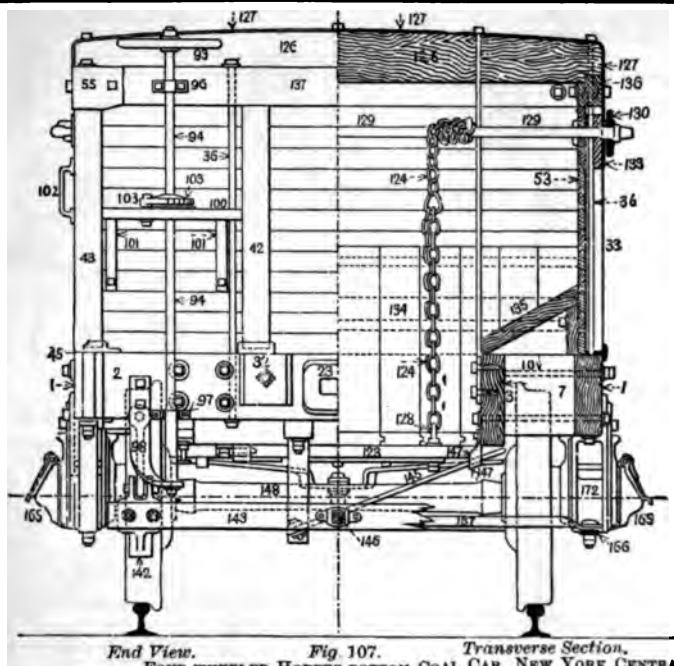
Fig. 104½. Perspective View.
FOUR-WHEELED CABOOSE CAR, PENNSYLVANIA RAILROAD.
(Old style; for new, see Figs. 43-47.)

NAMES OF PARTS; Figs. 102-104.

1. Side-sill.
2. End-sill.
3. Intermediate-sill.
4. Centre-sill.
5. Short Floor-timber.
6. Brake-hanger Timber.
8. Floor-timber Braces.
10. Sill Tie rod.
22. Needle-beam or Cross-frame Tie-timber.
23. Drawbar.
24. Draw-spring.
26. Draw timbers.
27. Floor.
30. Sill-step.
31. Sill-step Stay.
32. Dead-blocks.
33. Side Body-brace.
35. End Body-brace.
37. Body-counterbrace.
42. Body post.
43. Corner-post.
46. Plate.
52. Sheathing or Siding.
53. Inside-lining.
64. Door-sill.
81. Carline or Carling.
86. Roof-boards.
90. Eaves-moulding.
93. Brake-wheel.
94. Brake-shaft.
96. Upper Brake-shaft Bearing.
98. Brake-shaft Step.
102. Corner Grab-iron.
103. Brake Ratchet-wheel.
140. Coupling-pin.
141. Train Signal-lamp.
143. Brake-beam.
145. Brake-lever.
152. Lower Brake-rod.
165. Journal-box.
167. Pedestal Stay-rod.
168. Pedestal Tie-bar.
169. Pedestal-timber.
170. Spring-hanger.
171. Spring-hanger Iron.
172. Pedestal.
174. Lookout.

(Parts numbered 8, 164, 170, 171 and 174 are special to this car, and appear nowhere else.)





End View. Fig. 107. Transverse Section,
FOUR-WHEELED HOPPER-BOTTOM COAL CAR, NEW YORK CENTRAL & HUDSON RIVER RAILROAD.

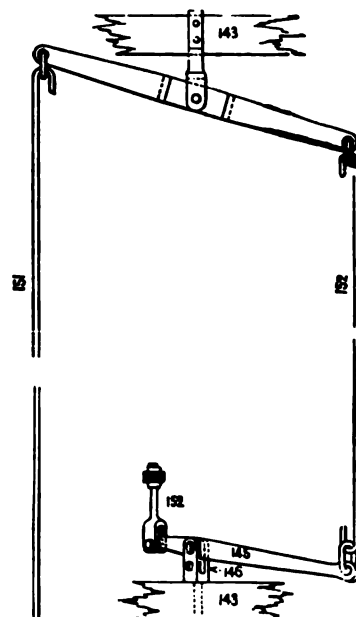


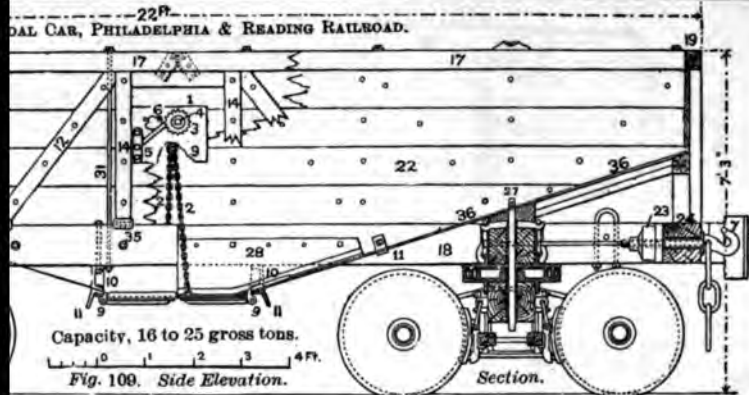
Fig. 108. Plan of Brake.

NAMES OF PARTS, Figs. 105-108.

- | | | |
|---------------------------------|--|----------------------------------|
| 1. Side-sill. | 55. Upper Corner-plate. | 133. Winding-shaft Plate. |
| 2. End-sill. | 57. Lower Corner-plate. | 134. Inclined End-floor. |
| 3. Intermediate Sill. | 93. Brake-wheel. | 135. Inclined Side-flooring. |
| 5. Short Floor-timber. | 94. Brake-shaft. | 136. Top Side-rail. |
| 6. Brake-hanger Timber. | 96. Upper Brake-shaft Bearing. | 137. Top End-rail. |
| 7. Floor-timber Distance-block. | 97. Lower Brake-shaft Bearing. | 138. Drawbar Cross-timber. |
| 10. Sill Tie-rod. | 98. Brake-shaft Step. | 139. Draw-gear Tie-rod. |
| 23. Drawbar. | 100. Brake-step. | 142. Brake-head. |
| 24. Draw-spring. | 101. Brake-step Bracket. | 143. Brake-beam. |
| 26. Draw timbers. | 102. Corner-handle. | 144. Brake-hanger. |
| 30. Sill-step. | 103. Brake Ratchet-wheel. | 145. Brake-lever. |
| 32. Dead-blocks. | 123. Drop-doors. | 146. Brake-lever Fulcrum. |
| 32'. Buffer-beam. | 124. Drop-door Chain. | 147. Brake-lever Guide. |
| 38. Side Body-brace. | 125. Drop-door Hinge. | 148. Brake-lever Bracket. |
| 34. Side Body-brace Rod. | 126. Drop-door Beam. | 149. Brake-lever-bracket Brace. |
| 36. Sill-and-Plate Rod. | 127. Strap for Drop-door Beam. | 151. Brake-shaft Connecting-rod. |
| 37. Body-counterbrace. | 128. Eye-bolt. | 152. Secondary Brake-rod. |
| 39. Brace-pocket. | 129. Winding-shaft. | 153. Inclined Floor-timbers. |
| 41. Double Brace-pocket. | 130. Winding-shaft Ratchet-wheel. | 165. Journal-box. |
| 42. Body-post. | 131. Pawl for Winding-shaft Ratchet-wheel. | 166. Pedestal Brace-tie Bar. |
| 43. Corner-post. | 132. Dog, for Pawl of Winding-shaft Ratchet-wheel. | 167. Pedestal Stay-rod. |
| 45. Corner-post Pocket. | | 172. Pedestal. |
| 53. Inside-lining. | | 173. Drawbar Friction-plate. |

(Nos. 32, 123 to 137 inclusive, 149, 152, 153, 167 and 173 are parts special to this car, and do not appear elsewhere, except in part, by different numbers on the following page, as there noted.)

22 ft.
DAL CAR, PHILADELPHIA & READING RAILROAD.



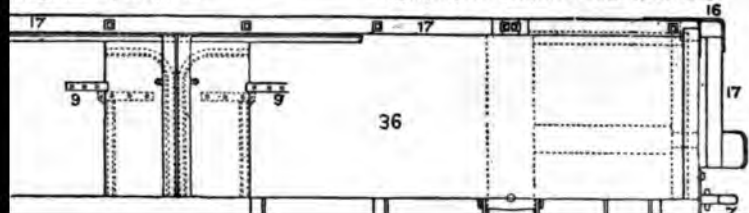
Capacity, 16 to 25 gross tons.

Fig. 100. Side Elevation.

Section.

Body bolster, 12 x 9 in.

Weight, 18,480 lbs. (each truck 4,800 lbs.).



(LIST CONTINUED FROM PREVIOUS PAGE.)

- | | |
|------------------------------------|----------------------------------|
| 23 (24). Draw-spring. | 31 (86). Sill and Plate Rods. |
| 24 (2). End-sill. | 32 (84). Side Body-brace Rod. |
| 25 (82). Dead-blocks. | 33 (41). Double Brace-pocket. |
| 26 (57). Lower Corner-plate. | 34 (89). Brace Pocket. |
| 27. Centre-pin or King-bolt. | (No number.) Corner-post Pocket. |
| 28. Side Hopper-plates. | 35. Body-post Pocket. |
| 29. Body-bolster Truss-rods. | 36 (184). See 20. |
| 30. Body-bolster Truss-rod Washer. | B. Truck Center-plates. |
| | F (128). Drop-door. |

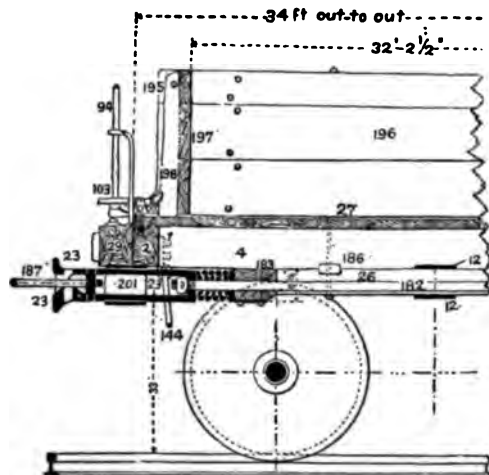


Fig. 113. Longitudinal Section.

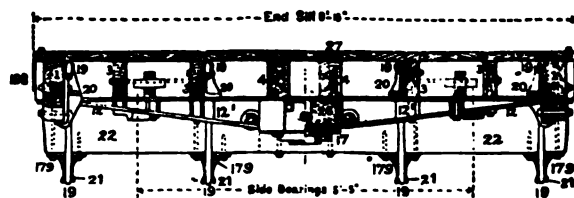
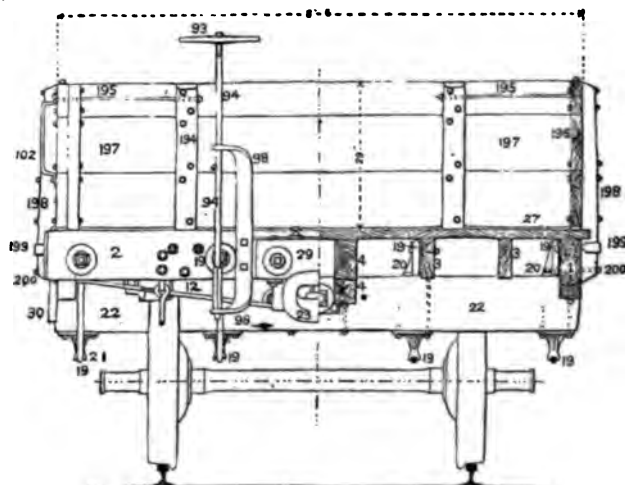


Fig. 114.

Section through Draw-spring.

Section through Bolster.



End Elevation. Fig. 115. Section through Centre of Car.

STANDARD GONDOLA OR PLATFORM CAR, NEW YORK CENTRAL & HUDSON RIVER RAILROAD,
with HOIT DRAW-GEAR (shown separately in Figs. 426-427.)

NAMES OF PARTS OF GONDOLA CAR: Figs. 113-115.

- | | | | |
|------------------------------------|--|----------------------------|--------------------------|
| 1. Side-sill. | 21. Body Truss-rod Bearing on Queen-post. | 93. Brake-wheel. | 187. Link. |
| 2. End-sill. | 22. Needle-beam or Cross-frame Tie-timber. | 94. Brake-shaft. | 194. Side-straps. |
| 3. Intermediate-sill. | 23. Drawbar. | 98. Brake-shaft Step. | 195. Side-strap Tie-rod. |
| 4. Centre-sill. | 24. Draw-spring. | 103. Brake Ratchet-wheel. | 196. Side-plank. |
| 12. Body-bolster. | 26. Draw-timbers. | 144. Brake-hanger. | 197. End-plank. |
| 12'. Body - bolster Spacing-block. | 27. Floor. | 179. Queen-post. | 198. Stake. |
| 19. Body Truss-rod. | 29. Buffer-block. | 182. Draw-rod. | 199. Stake-pocket Strap. |
| 20. Body Truss rod Saddle. | 30. Sill-step. | 183. Follower-plate Block. | 200. Stake-bolt. |
| | | 186. Packing blocks. | 201. Drawbar Carry-iron. |

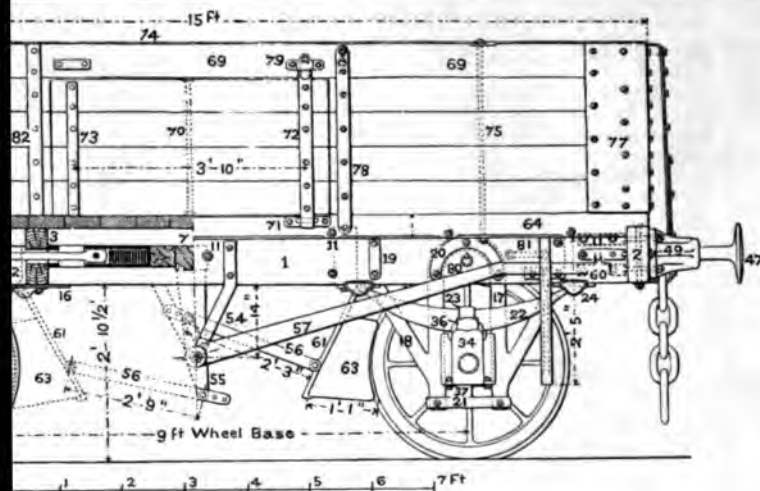
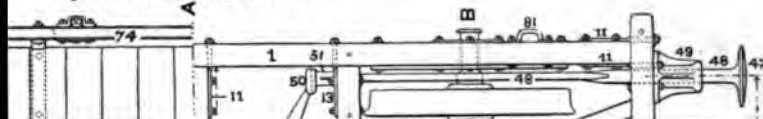


Fig. 116. Section and Elevation.



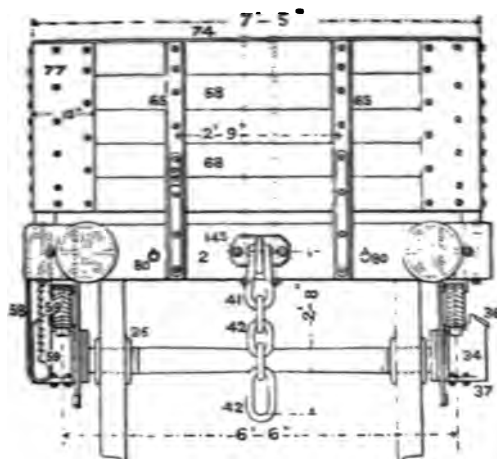
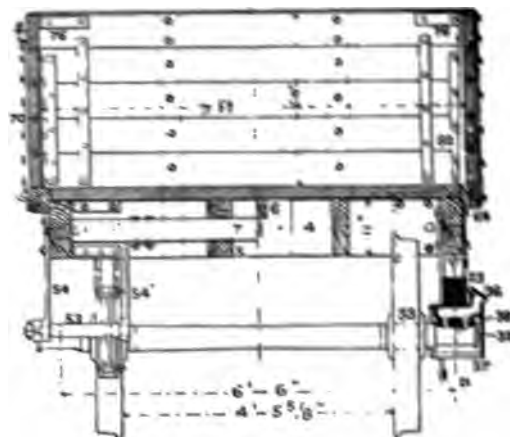


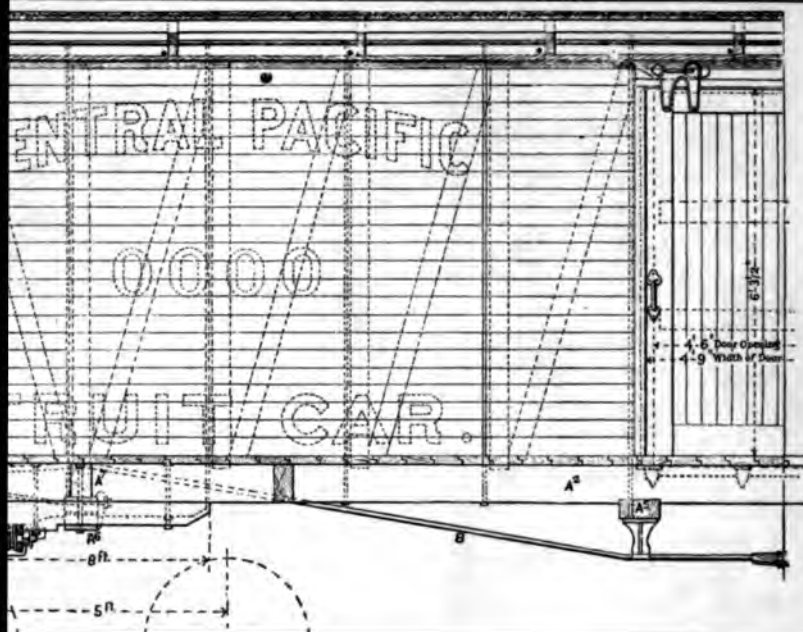
Fig. 118. End Elevation.

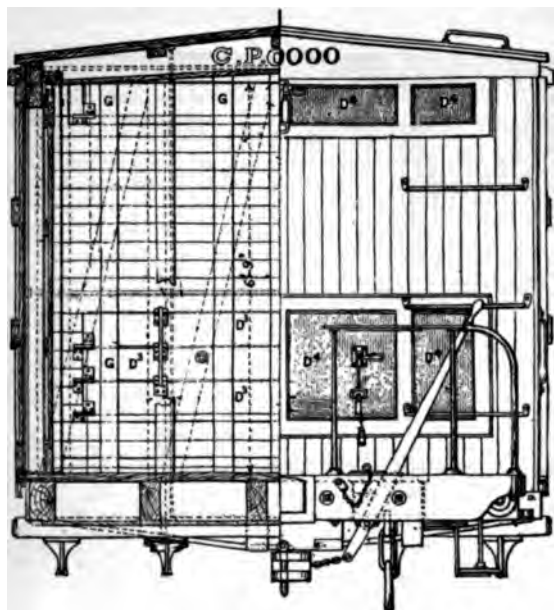


Section through Centre. Fig. 119. Section through Axle.

NAMES OF PARTS OF ENGLISH "GOODS WAGON," Figs. 118-119.

- | | | | |
|--|--|--|---|
| 1. Solebar. | 26. Boss, or Nave. | 52. Auxiliary Draw-spring (Rubber). | 68. End Board, or End Sheeting. |
| 2. Headstock, or Buffer Beam. | 27. Spoke. | 53. Brake-shaft, or Weigh-bar. | 69. Continuous Topside. |
| 3. Cross bearer, Cross-bar, or Transome. | 28. Rim. | 54. Brake-shaft Hanger (V pattern). | 70. Falling Door, or Flap Door. |
| 4. Diagonal. | 29. Tire. | 54'. Brake-shaft Hanger (Plate pattern). | 71. Strap Hinge, or Door-hinge Joint. |
| 5. Middle longitudinal. | 26, 27 and 28. Wheel-Centre, or Skeleton. | 55. Brake-shaft Arm, or Brake Double-lever. | 72. Hinge-plate, or Door-hinge. |
| 6. End Half-longitudinal. | 30. Key-ring Tire-Fastening. | 56. Brake rod, or Brake Push-rod. | 73. Hinge-plate Washer, or Door hinge Washer-plate. |
| 7. Brake-shaft Cross-bearer, or Centre Crossbar. | 31. Journal. | 57. Brake-lever, or Long Brake-lever. | 74. Coping, or Capping-iron. |
| 8. Buffer-spring Bed, or Back Chock. | 32. Collar of Journal. | 58. Brake-lever Guard. | 75. Through Body bolt. |
| 9. Longitudinal Tie-rod. | 33. Wheel-seat. | 59. Brake-lever Ratchet. (58 and 59 are also termed Brake-lever Rack.) | 76. Inside Body Corner-knee. |
| 10. Transverse Tie-rod. | 34. Grease Axle-box. | 60. Brake-lever Handle. | 77. Outside Corner-plate. |
| 11. Strap Bolt. | 35. Grease-Chamber. | 61. Brake-hanger, or Brake-block Hanger. | 78. Strap Washer, or Washer-plate. |
| 12. Spider-plate (plain), or Underframe Plate. | 36. Axle-box Cover, or Lid. | 62. Brake-hanger Bracket. | 79. Pulling-door Latch, consisting of Door Fastening, Staple, Cotter and Chain. |
| 13. Axle-guard Crown. | 37. Axle-box Keep. | 63. Brake-block (wood). | 80. Sheet-ring and Staple. |
| 14. Axle-guard Wing. | 38. Axle-box Bearing, or Brass. | 64. Crib-rail, Rocker rail, or Side-rail. | 81. Horse-hook, or Towing-Hook. |
| 15. Axle-guard, "W" pattern. | 39. Drawbar. | 65. End Stanchion, or End Muntin. | 82. Body Knee. |
| 16. Axle-guard Wing-washer. | 40. Draw-hook. | 66. Floor-Board, or Floor Batten. | 145. Draw-hook Washer, or Drawbar Front-plate. |
| 17. Axle-guard Crown-washer. | 41. Coupling-shackle. | 67. Side Board, or Side Sheeting. | 146. Draw-spring (rattle-plate). |
| 18. Axle-guard Crown-washer. | 42. Coupling-link. | | |
| 19. Axle-guard Keep, Horn-stay, or Bridle. | 41 and 42. Wagon-coupling, or Draw-chain, consisting of Shackle, Shackle-pin, and Links. | | |
| 20. Axle-guard Crown-washer. | 47. Buffer-head. | | |
| 21. Axle-guard Keep, Horn-stay, or Bridle. | 48. Buffer-rod. | | |
| 22. Bearing-spring. | 49. Buffer-rod Guide, or Buffer-Block. | | |
| 23. Bearing-spring Buckle, or Hoop. | 50. Buffer-rod Shoe. | | |
| 24. Bearing spring Shoe. | 51. Plate or Laminated Buffering and Draw-spring. | | |
| 25. Wheel (Solid Wrought-iron Single-spoke). | | | |





Section. Fig. 123. End Elevation.

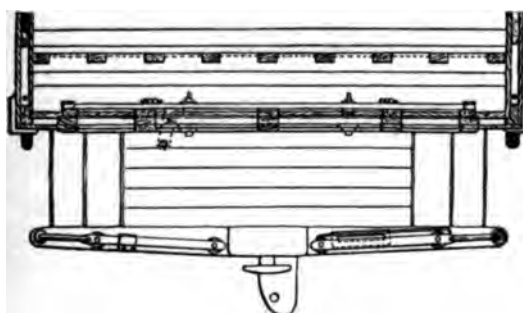


Fig. 124.

Plan of Floor and Platform, showing interior Guard-posts.

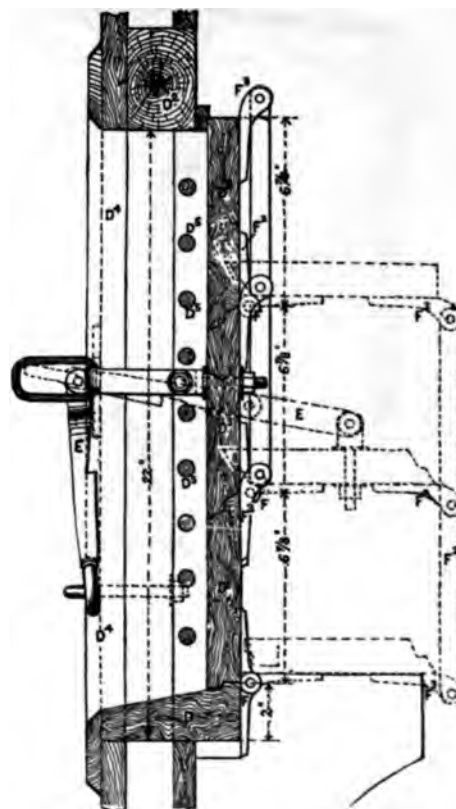


Fig. 125.

Enlarged Section through Lower Ventilator.

NAMES OF PARTS, Figs. 121-125.

- | | | | |
|---|---|--------------------------------------|--|
| A. Side-sill. | A ⁴ . Body-bolster. | B ² . Coupling-hook rod. | E. Ventilator Latch. |
| A ² . Centre-sill. | A ⁷ . Bolster Distance-block. | D. Ventilator-sill. | F. Ventilator Hinge. |
| A ³ . Intermediate-sill. | A ⁸ . Floor-timber Distance-block. | D ¹ . Ventilator Cap. | F ² . Ventilator Connecting-link. |
| A ⁴ . End-sill. | B. Truss-rod. | D ² . Ventilator. | F ³ . Ventilator Pivot-pin. |
| A ⁵ . Needle-beam or Cross-frame Tie-timber. | B ³ . Draw-rod. | D ³ . Ventilator Netting. | G. Guard-posts. |
| | | D ⁴ . Ventilator Grating. | |

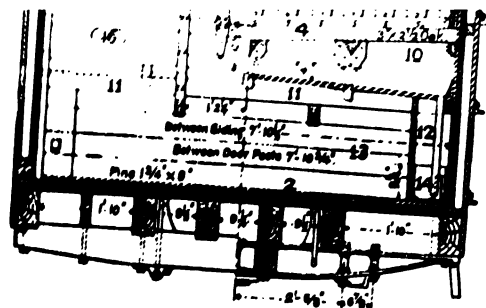
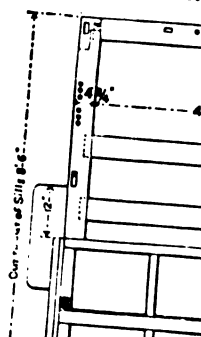
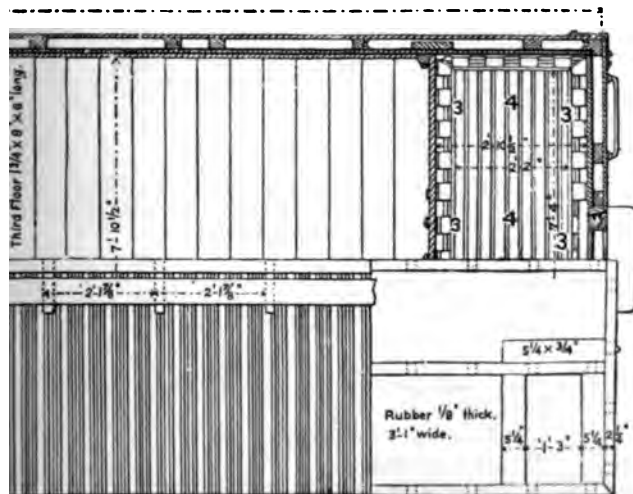
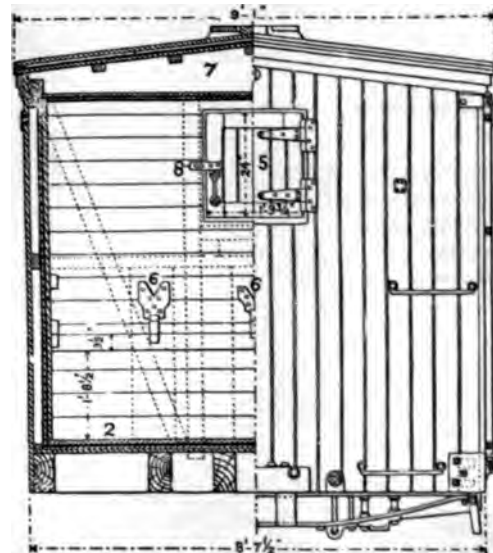
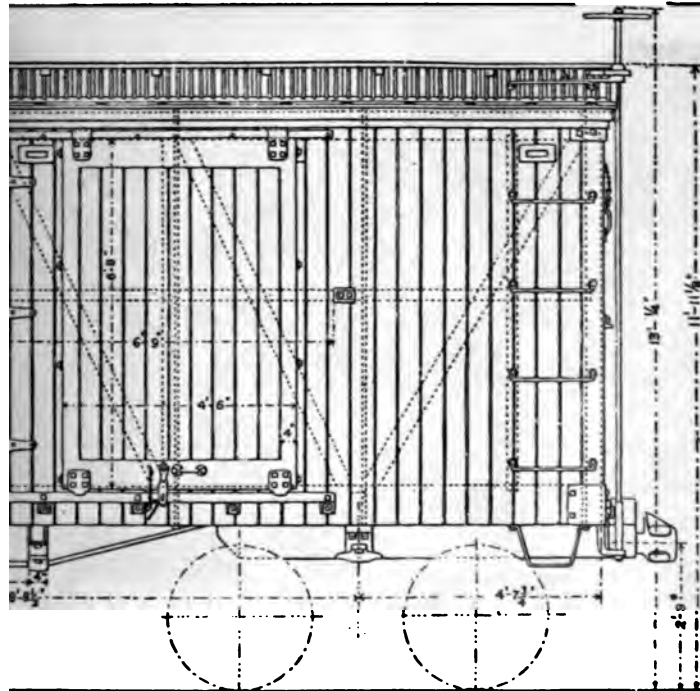


Fig. 126. End Section.



NAMES OF PARTS, Figs. 126-129.

1. Inside-door.
2. Double-floor.
3. Ice box.
4. Ice box (grating).
5. Ice-door (outside).
6. Grating Cleats.
7. Air-space.
8. Ice-door (inside).
9. Ventilator.
10. Ice box Bottom.
11. Lower Grating.
12. Drip pipe, or Drain.
13. Air-space.
14. "

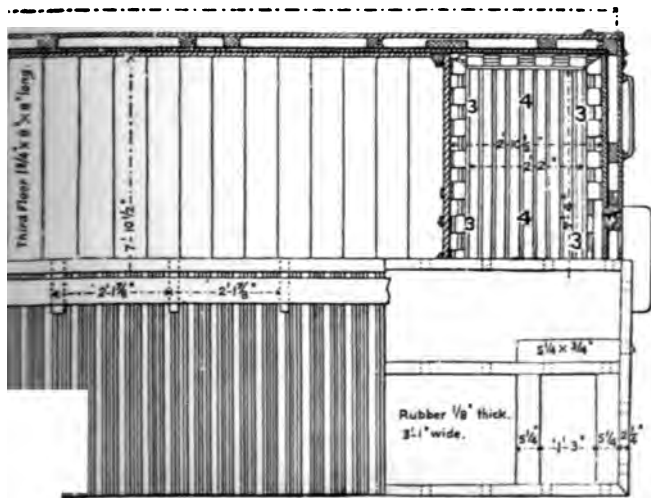
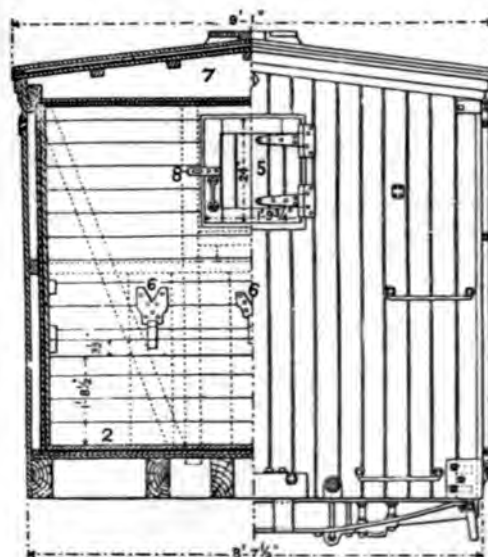
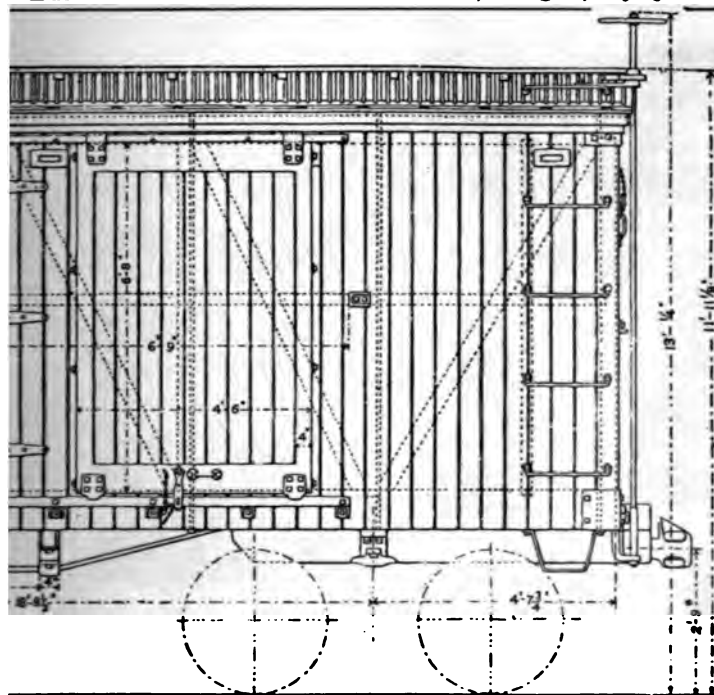


AYER "RUBBER" REFRIGERATOR CAR.

Average weight.....	23,000 lbs.
Cost (1884) double-lined.....	\$750 @ \$800
" " single-lined.....	650 @ 700
Lining, double.....	200 @ 225
" single.....	125 @ 150

SCALE.





AYER, "RUBBER" REFRIGERATOR CAR.

Average weight.....	23,000 lbs.
Cost (1884) double-lined.....	\$750 @ \$800
" " single-lined.....	650 @ 700
Lining, double.....	200 @ 225
" single.....	125 @ 150

SCALE.

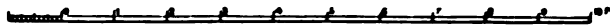




Fig. 130.
LORENZ REFRIGERATOR CAR.

NAMES OF PARTS, LORENZ REFRIGERATOR CAR; Figs.
130-130 $\frac{1}{2}$.



Fig. 130½.

LORENE REFRIGERATOR CAR, showing ICE-RACK (about 30 in. wide) and ICE-DOORS.

(In the above figure the air inlet pipe U terminates in a continuous conduit passing around the bottom of the car behind the inside lining, instead of discharging directly into the car, as in Fig. 130.)

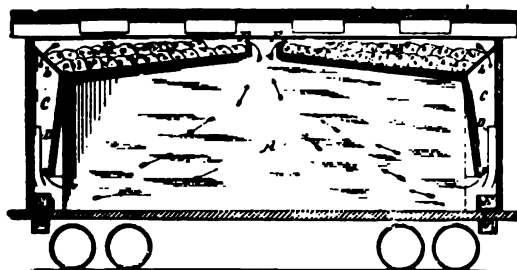


Fig. 131. Longitudinal Section.

ELY, CLOUD & WALL REFRIGERATOR CAR.

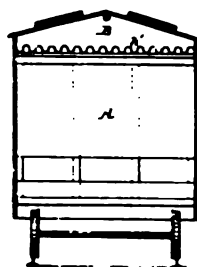
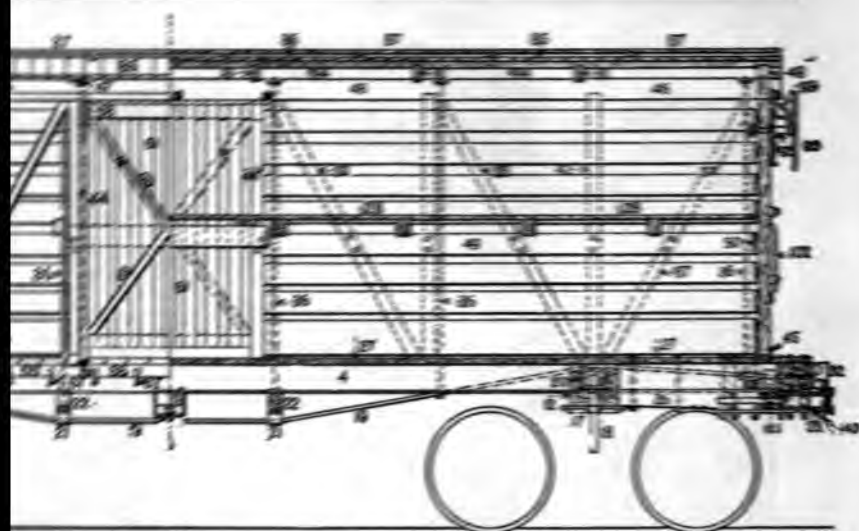


Fig. 131½. End Section

NAMES OF PARTS, Figs. 131-131½.

- A. Refrigerator.
- B. Ice-box.
- C. Air-flue.
- D. Condensing Diaphragms.
- E. Drip-dish and Trap.
- F. Air-holes.
- b. Ice-box Grating.
- h'. Ice-box Bottom.



Scale



Fig. 132.

Longitudinal Section.

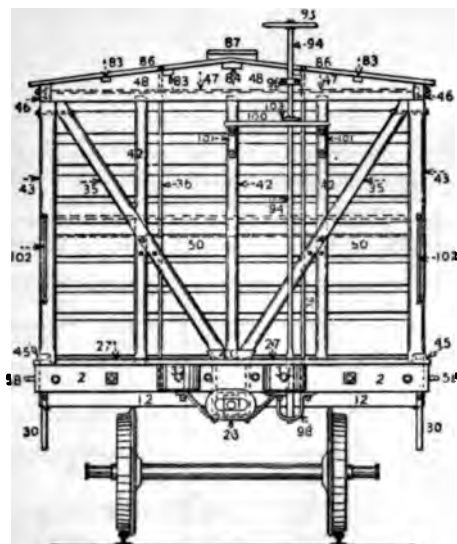


Fig. 134. End View.

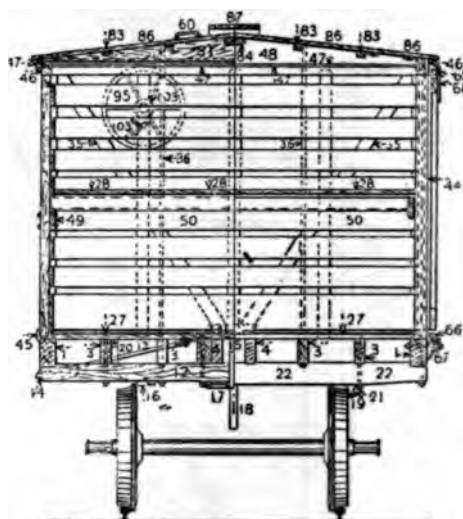
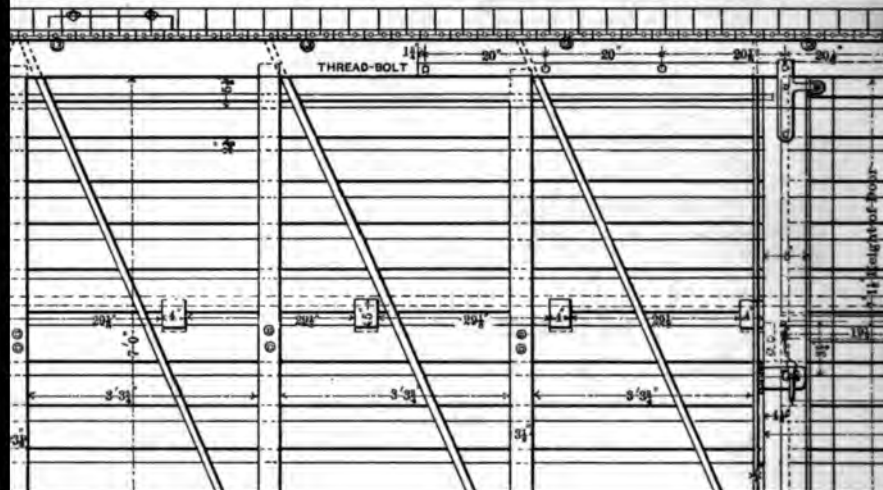


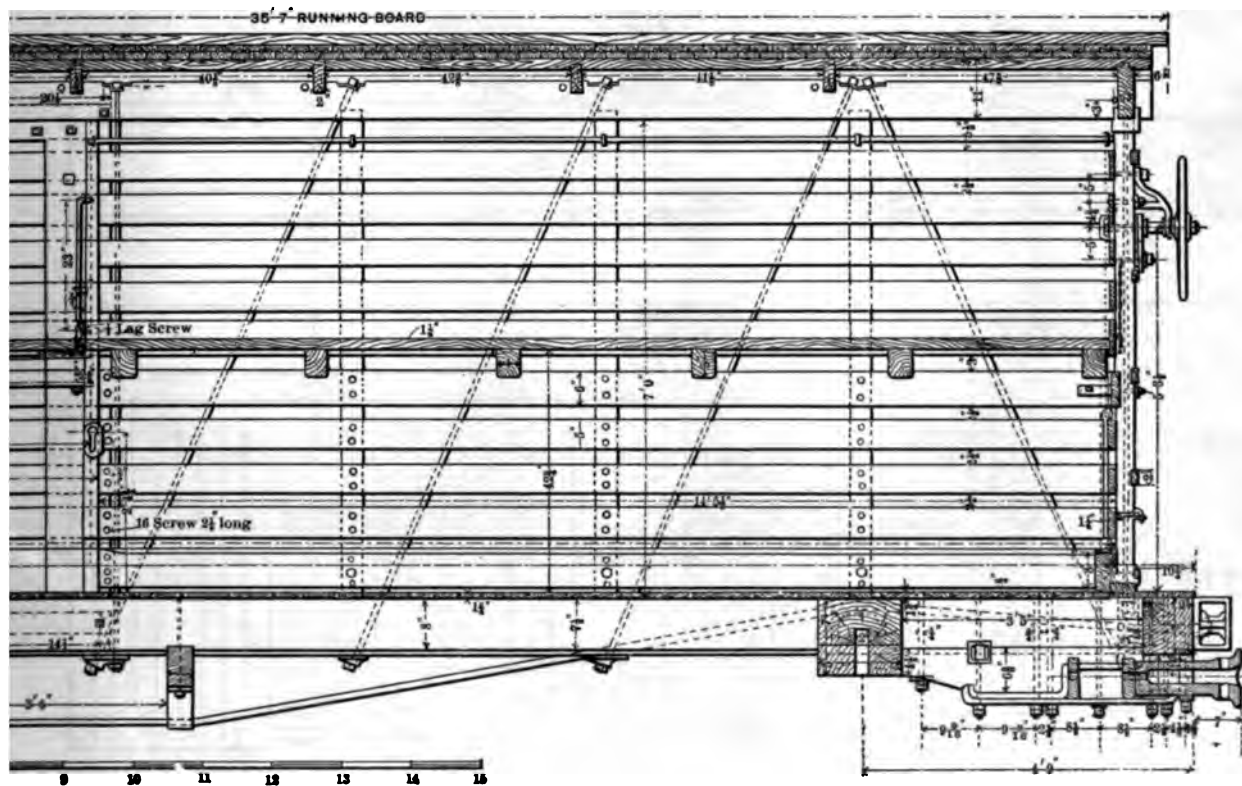
Fig. 135. Transverse Section.

DOUBLE-DECK STOCK CAR, PENNSYLVANIA RAILROAD.
(Old standard ; for new, see Figs. 136-138.)

NAMES OF PARTS OF STOCK CAR, Figs. 132-135.

- | | | | |
|--|---------------------------------|-------------------------|--------------------------------|
| 1. Side-sill. | 23. Drawbar. | 45. Corner-post Pocket. | 84. Ridge-pole. |
| 2. End-sill. | 26. Draw-timbers. | 46. Plate. | 85. Roof-braces. |
| 3. Intermediate-sill. | 27. Floor. | 47. Plate-rod. | 86. Roof-boards. |
| 4. Centre-sill. | 28. Upper-floor or Double-deck. | 48. End-plate. | 87. Running-board. |
| 9. Sill Knee-iron. | 30. Sill-step. | 49. Girth. | 93. Brake-wheel. |
| 12. Body-bolster. | 31. Sill-step Stay. | 50. End-girth. | 94. Brake-shaft. |
| 13. Body-bolster Truss-rod. | 32. Dead-blocks. | 58. Pull-iron. | 95. Horizontal Brake-shaft. |
| 14. Body-bolster Truss-rod Washer. | 33. Side Body-brace. | 60. Roof Grab-iron. | 96. Upper Brake-shaft Bearing. |
| 15. Body-bolster Truss-block. | 35. End Body-brace. | 61. Grated-door. | 98. Brake-shaft Step. |
| 16. Body Side-bearing. | 36. Sill-and-plate Rod. | 65. Top Door-track. | 99. Brake-shaft Bracket. |
| 17. Body Centre-plate. | 37. Body-counterbrace. | 66. Bottom Door-track. | 100. Brake-step. |
| 18. King-bolt or Centre-pin. | 40. Right-hand Brace-pocket. | 67. Door-track Bracket. | 101. Brake-step Bracket. |
| 19. Body Truss-rod. | 41. Double Brace-pocket. | 68. Door-hanger. | 102. Corner-handle. |
| 20. Body Truss-rod Saddle. | 42. Body-post. | 69. Door-brace. | 103. Brake Ratchet-wheel. |
| 21. Body Truss-rod Bearing. | 43. Corner-post. | 70. Door-shoe. | 105. Brake-shaft-chain Sheave. |
| 22. Needle-beam or Cross-frame Tie-timber. | 44. Door-post. | 81. Open-door Stop. | 140. Coupling-pin. |
| | | 83. Purlin. | |



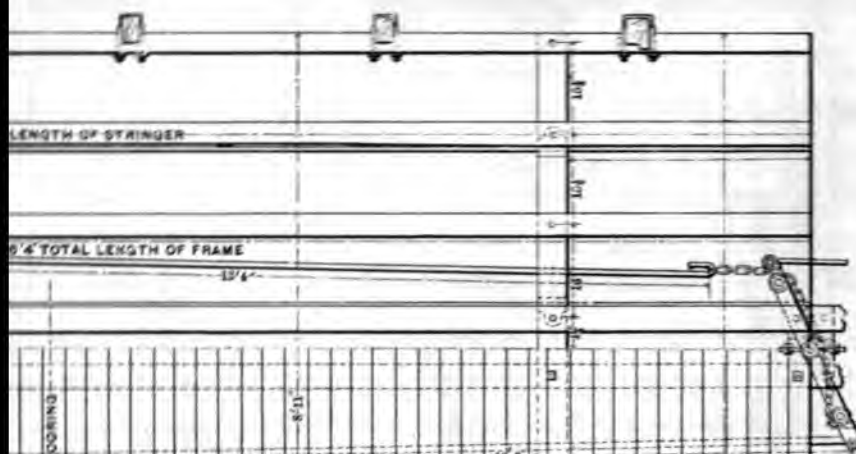


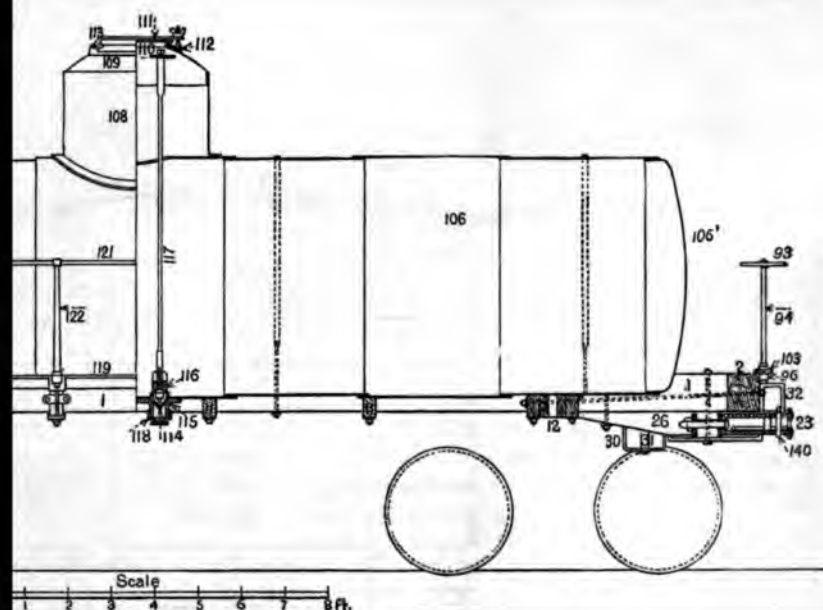
WANDA RAILROAD.

W-135. A new and modified design for this car is now (1884) in preparation.)

L
10,000 lbs.

Capacity, Hogs (Double-deck), 30,000 to 35,000 lbs.
Sheep (Double-deck), 22,000 to 28,000 lbs.





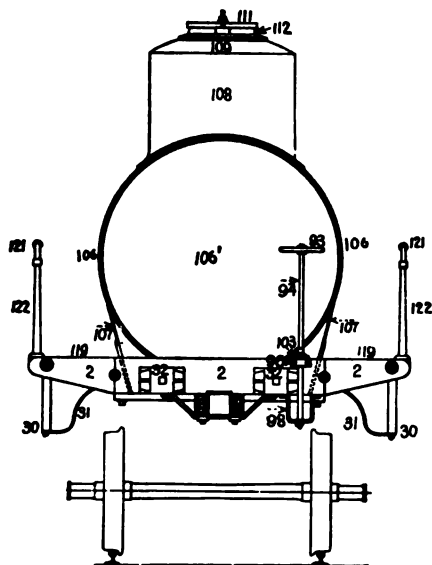


Fig. 141. End View.

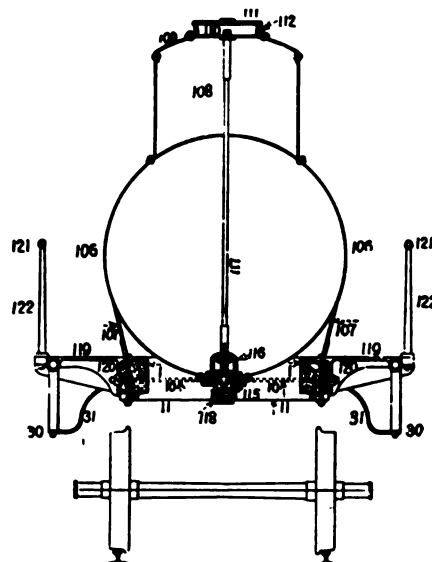


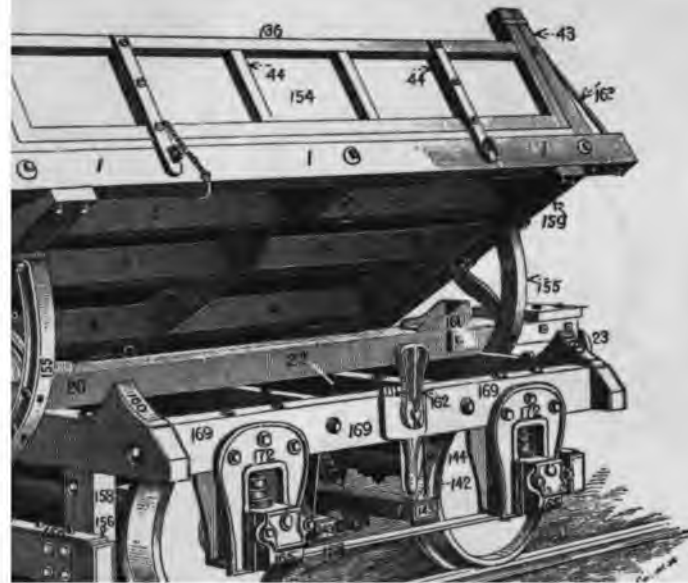
Fig. 142. Transverse Section.

TANK CAR OR OIL CAR.

NAMES OF PARTS OF TANK CAR: Figs. 141-142.

- | | | |
|-------------------------------|--------------------------------|--------------------------------------|
| 1. Sill. | 96. Upper Brake-shaft Bearing. | 115. Tank-valve Seat or Tank-nozzle. |
| 2. End-sill. | 98. Brake-shaft Step. | 116. Tank-valve Cage. |
| 10. Sill Tie-rod. | 106. Tank, for Tank-car. | 117. Tank-valve Rod. |
| 11. Transverse Floor-timbers. | 106'. Tank-head. | 118. Tank-nozzle Cap. |
| 12. Body-bolster. | 107. Tank-band. | 119. Running-board. |
| 23. Draw-bar. | 108. Tank-dome. | 120. Running-board Brackets. |
| 26. Draw-timbers. | 109. Dome-head. | 121. Hand-rail. |
| 30. Sill-step. | 110. Man-hole. | 122. Hand-rail Post. |
| 31. Sill-step Stay. | 111. Man-hole Cover. | 138. Drawbar Cross-timber. |
| 32. Dead-blocks. | 112. Man-hole Ring. | 139. Draw-gear Tie-rod. |
| 93. Brake Wheel. | 113. Man-hole Hinge. | 140. Coupling-pin. |
| 94. Brake Shaft. | 114. Tank-valve. | |

(Parts special to this car, Nos. 11 and 106 to 122, inclusive.)



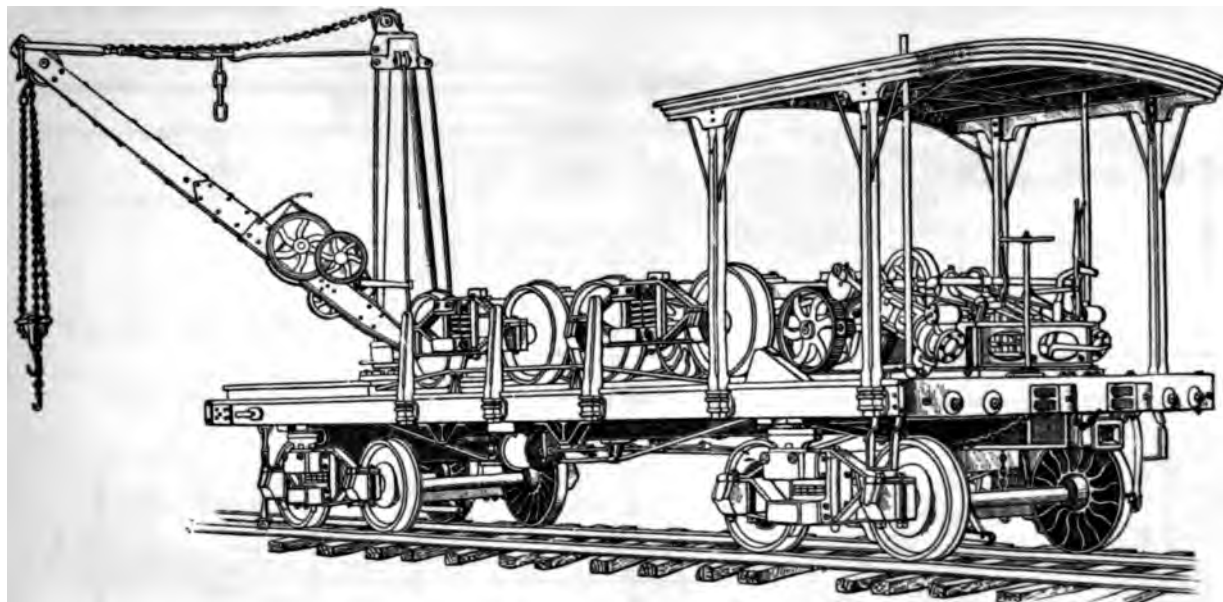


Fig 144. STEAM DERRICK CAR, with IRON FRAME; BUFFALO, NEW YORK & PHILADELPHIA RAILROAD.

Showing CRABS or TONGS for fastening the car to the track.

Weight, 60,000 lbs. Length, out to out of drawbar, 33 ft. 0 1/4 in.

(Other Wrecking and Derrick Cars are shown in Figs. 73 to 80.)

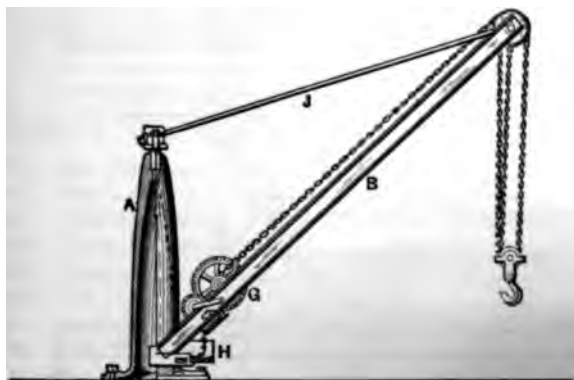


Fig. 145. PILLAR CRANE.

(Largely used on Wrecking C-

NAMES OF PARTS, Fig. 145.

- A. Mast.**
- B. Boom.**
- G. Spur-wheel of Hoisting gear.**
- H. Chain-box.**
- J. Stay-rod or Tension-rod.**

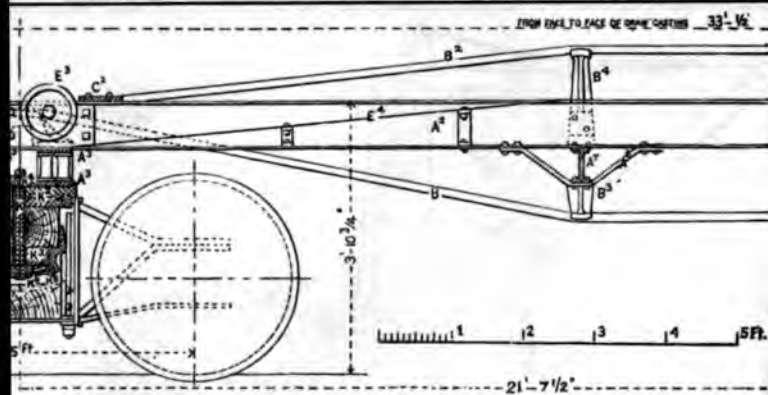
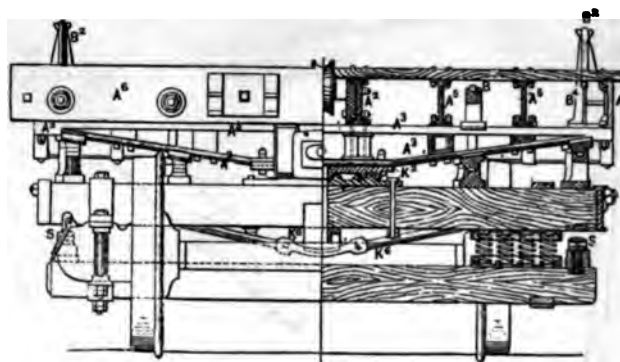


Fig. 146. Longitudinal Section.





End Elevation. Fig. 148. Section.
Outside Sills, A : 8" Channel Iron (52 lb.). Intermediate and Centre Sills : 8" I-beams (85 lb.). Needle-beams, 6" I-beams.

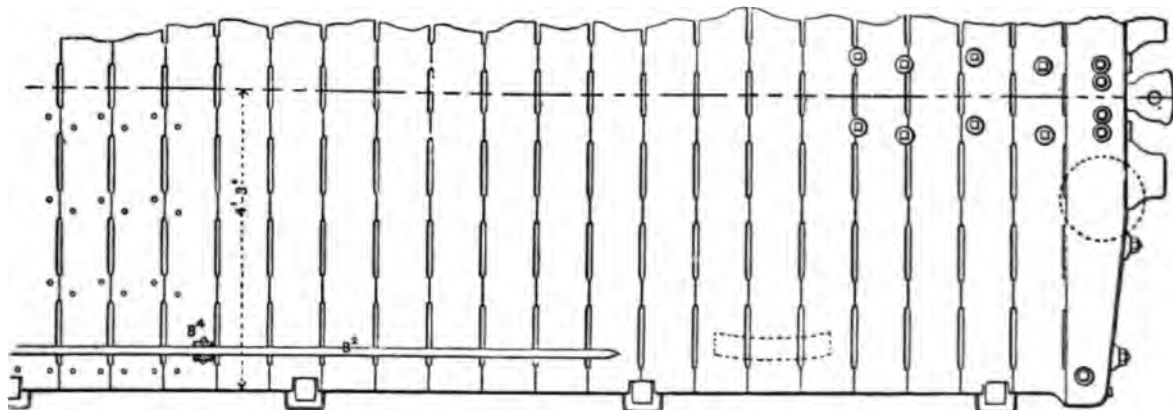


Fig. 149. Plan of Floor.
STEAM DERRICK CAR, with IRON FRAME. BUFFALO, NEW YORK & PHILADELPHIA RAILROAD. Figs. 144-153.

NAMES OF PARTS, Figs. 144-150.

- A. Side-sills.
- A'. Centre-sills.
- A". Body-bolster.
- A'. End-sill Channel-bar.
- A". Intermediate-sills.
- A'. End-sill.
- A'. Needle-beam.
- B. Body Truss-rod.
- B'. Hog-chain or Inverted Truss-rod.
- B". Queen-Post.

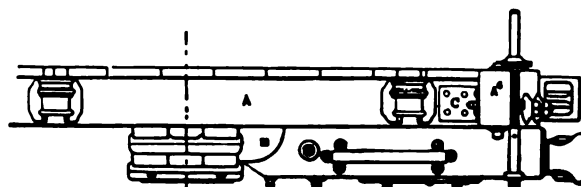
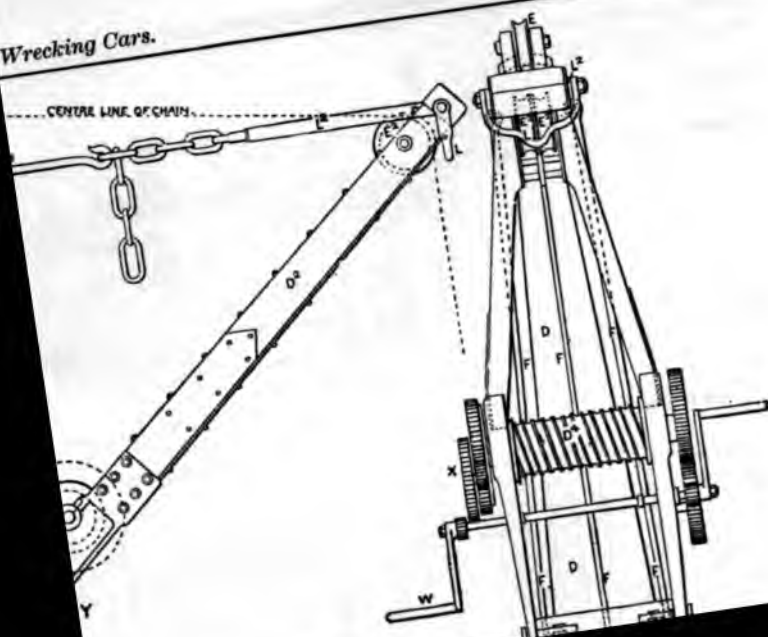


Fig. 150. Side Elevation of Draw-gear.

- B'. Hog-chain Queen-post.
- C. End-sill Brackets.
- C'. Tie-plates.
- E'. Hoisting-chain Sheave.
- K. King-bolt or Centre-pin.
- K'. Centre Plates.
- K". Truck-bolster Truss-rod Bearing.
- K'. Upper King-bolt Key.
- K". Lower King-bolt Key.
- K". Truck-bolster Truss-rod.

FIGS.

Wrecking Cars.

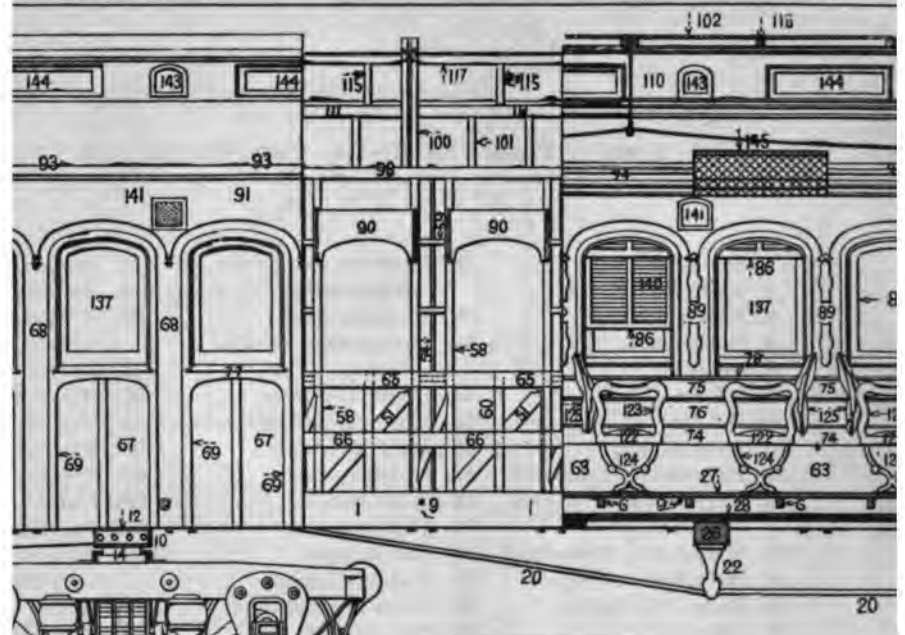


NAMES OF PARTS; Figs. 155-158. PASSENGER CAR-BODY, CENTRAL RAILROAD OF NEW JERSEY.

- | | | | |
|---|--|--|---------------------------------|
| 1. Side-sills. | 38. Platform End-timber, or Buffer-beam. | 78. Inside Window-sill. | 124. Seat-stand. |
| 2. End-sills. | 39. Platform-post. | 85. Window-sash. | 125. Seat-back. |
| 3. Intermediate-sills. | 40. Base-washer, for Platform-post. | 86. Window-blind Sash (lower and upper). | 127. Foot-rest. |
| 4. Centre-sills. | 41. Platform-rail. | 89. Inside Window-panel. | 128. Stove, or Heater. |
| 5. Bridging. | 42. Platform-railling Chain. | 90. Window-lintel. | 129. Stove-pipe Jack. |
| 6. Sill Knee-iron. | 44. Body Hand-rail. | 91. Letter-board. | 130. Saloon. |
| 9. Sill Tie-rod. | 45. Platform-steps. | 93. Eaves-moulding. | 131. Closet Hopper. |
| 10. Body-bolster. | 46. Tread-board. | 94. Inside-cornice. | 132. Urinal. |
| 11. Body-bolster Truss-rod. | 47. Step-iron. | 95. Plate. | 133. Water-cooler. |
| 12. Body-bolster Truss-rod Washer. | 48. Step-hanger. | 99. Door-lintel. | 136. Lamp-jack. |
| 13. Body-bolster Truss-block. | 51. Side Body-brace. | 100. Carline, or Compound-carline. | 137. Windows. |
| 14. Body Side-bearings. | 53. Brace Straining-rod. | 101. Rafter. | 140. Window-blind. |
| 15. Body Centre-plate. | 54. Sill-and-plate Rod. | 102. Roof-boards. | 141. Frieze-ventilator. |
| 16. King-bolt. | 55. Body Counterbrace. | 103. Platform-roof. | 142. End-ventilator. |
| 17. King-bolt Plate. | 58. Window-post. | 104. Platform-roof Carline. | 143. Deck Side Ventilator. |
| 18. Check-chain. | 59. Window-panel Furring. | 105. Platform-roof End-carline. | 144. Deck Sash, or Window. |
| 19. Body Check-chain Eye. | 60. Stud. | 106. Roof-apron. | 145. Basket rack. |
| 20. Body Truss-rod. | 61. Corner-post. | 110. Clear-story, or Upper Deck. | 146. Door-mullion. |
| 21. Body Truss-rod Saddle. | 62. Door-post. | 111. Deck Sill. | 148. Middle Door-rail. |
| 22. Body Queen-post. | 63. Truss-plank. | 113. Deck End-sill. | 149. Top-rail, of Door. |
| 23. Turnbuckle. | 65. Belt-rail. | 115. Deck Post. | 150. Door-stile. |
| 24. Needle-beam, or Cross-frame Tie-timber. | 66. Panel-rail. | 116. Deck End-panel, or Ventilator. | 151. Door panel. |
| 27. Main Floor, or Car Floor. | 67. Outside-panel. | 117. Deck Plate. | 152. Brake-shaft. |
| 28. Deafening-ceiling. | 68. Outside Window-panel. | 118. Upper-deck Carline. | 153. Brake-shaft Step. |
| 29. Dracbar. | 69. Panel-strips. | 122. Car Seat. | 155. Lower Brake-shaft Bearing. |
| 30. Draw-spring. | 70. End-panel. | 123. Seat-end, or Aisle Seat-end. | 156. Upper Brake-shaft Bearing. |
| 31. Draw-timbers. | 71. End Window-panel. | | 157. Brake-wheel. |
| 34. Platform, Platform-floor. | 74. Lower Wainscot-rail. | | 158. Brake-atchet-wheel. |
| 35. Platform-sills. | 75. Upper Wainscot-rail. | | 159. Brake-pawl. |
| 36. Platform-timber Clamps. | 76. Wainscot-panel. | | 160. Brake-chain Worm. |
| 37. Platform Short-sills. | 77. Outside Window-sill. | | |

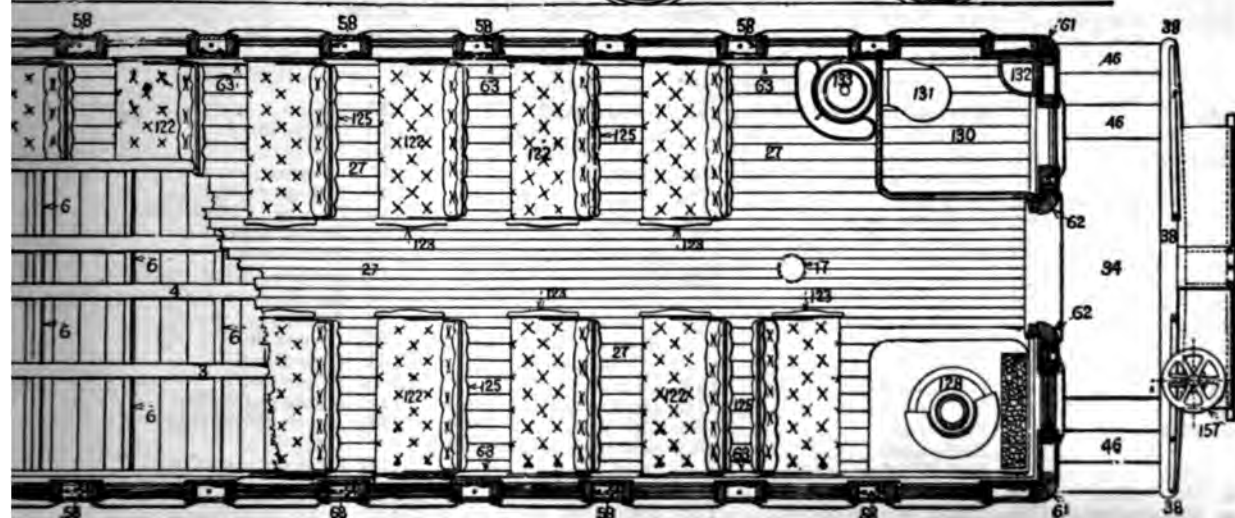
ger; Day Coaches.

E 58



This technical drawing shows a longitudinal section of a building's framing. The structure features a series of vertical studs and horizontal joists. Diagonal bracing is used for structural support. The roof is shown with a curved profile. Various components are labeled with numbers, including 100, 118, 101, 103, 104, 105, 106, 113, 116, 102, 62, 58, 65, 54, 66, 53, 27, 6, 9, 128, 20, 31, 34, 38, 30, 29, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 15 ft. The caption below the drawing reads: "Longitudinal Section showing Framing."

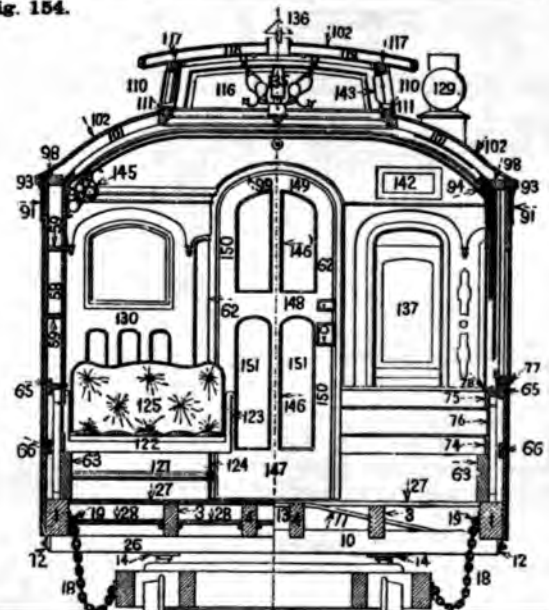
Longitudinal Section showing Framing.



Plan showing Floor, Seats, etc.

**Plan showing Floor Framing.
ROAD OF NEW JERSEY.**

f Parts with Fig. 154.

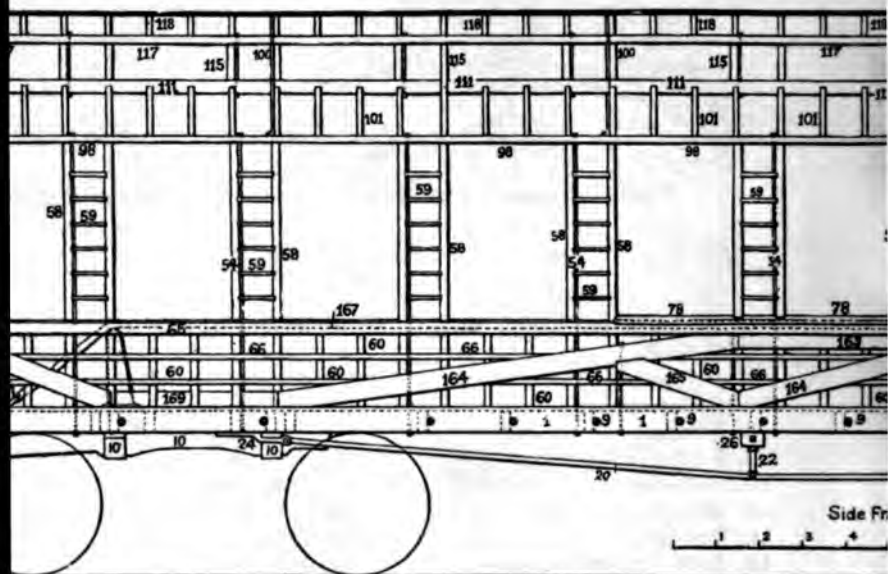


NAMES OF PARTS; Figs. 159-160. CHAIR CAR, CHICAGO & ALTON RAILROAD, ON FOLLOWING PAGE.

- | | | |
|---|---------------------------|--|
| 1. Side-sills. | 45. Platform-steps. | 100. Carline, or Compound-carline. |
| 2. End-sills. | 46. Tread-board. | 101. Rafter. |
| 3. Intermediate-sills. | 54. Sill and Plate Rod. | 103. Platform-roof. |
| 4. Centre-sills. | 58. Window-post. | 106. Roof-apron. |
| 6. Bridging. | 59. Window-panel Furring. | 110. Clear-story, or Upper Deck. |
| 9. Sill Tie-rod. | 60. Stud. | 111. Deck Sill. |
| 10. Body-bolster. | 61. Corner-post. | 115. Deck Post. |
| 14. Body Side-bearings. | 63. Truss-plank. | 117. Deck Plate. |
| 18. Check-chain. | 65. Belt-rail. | 118. Upper-deck Carline. |
| 19. Body-check-chain Eye. | 66. Panel-rail. | 122. Car Seat. |
| 20. Body Truss-rod. | 67. Outside-panel. | 124. Seat-stand. |
| 22. Body Queen-post. | 68. Outside Window-panel. | 137. Window. |
| 23. Turnbuckle. | 69. Panel-strips. | 144. Deck Sash, or Window. |
| 24. Truss-rod Iron. | 74. Lower Wainscot-rail. | 145. Basket-rack. |
| 25. Needle-beam, or Cross-frame Tie-timber. | 75. Upper Wainscot-rail. | 163. Compression Beam. |
| 27. Main Floor, or Car Floor. | 76. Wainscot-panel. | 164. Compression Beam Brace. |
| 28. Deafening-ceiling. | 77. Outside Window-sill. | 165. Counterbrace. |
| 34. Platform, Platform-floor. | 78. Inside Window-sill. | 166. End Counterbrace. |
| 37. Platform Short-sills. | 85. Window-sash. | 167. Body Brace Rod, or Hog-chain Rod. |
| 38. Platform End-timber, or Buffer-beam. | 89. Inside Window-panel. | 168. Body Counterbrace Rod. |
| 39. Platform-post. | 91. Letter-board. | 169. End Compression Beam. |
| 40. Base-washer, for Platform-post. | 93. Eaves-moulding. | 170. Upper Deck, or Clear-story. |
| 41. Platform-rail. | 94. Inside-cornice. | 171. Lower Deck. |
| | 98. Plate. | |

er; *Day Coaches.*

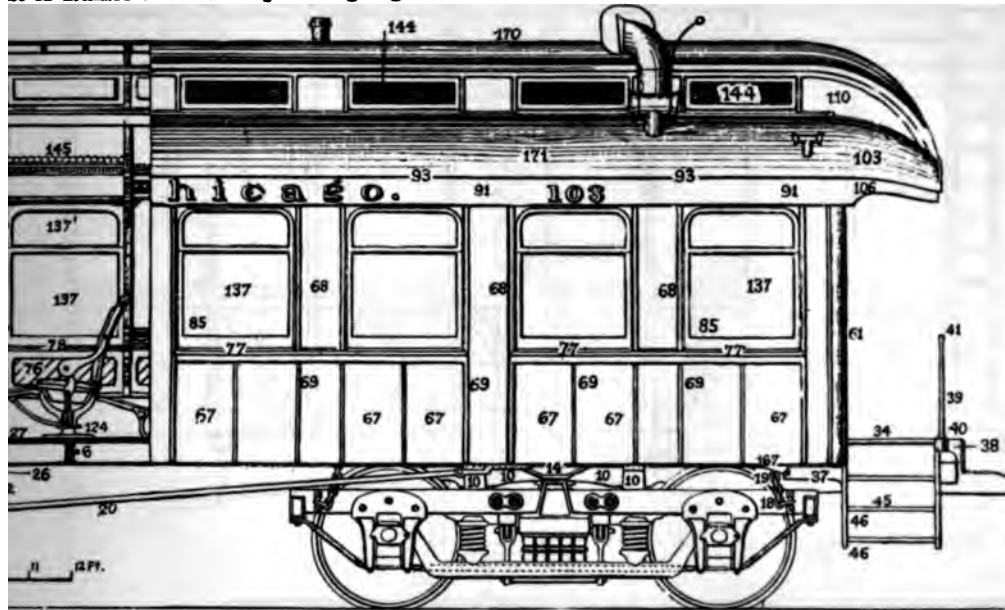
E 62



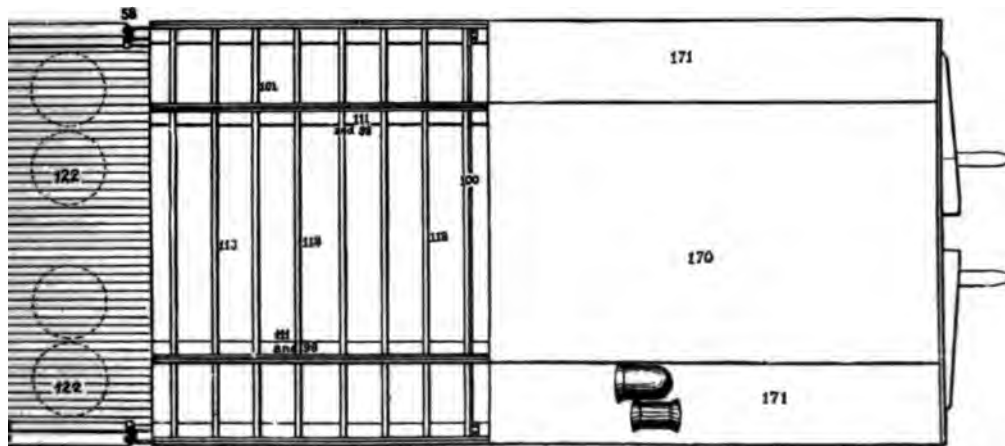
CAR-BODIES, Passenger; Day Coaches.

Figs. 159-160

st of Names of Parts on preceding Page.



or example of the same style is shown in fig. 190.)



DAD.
is given in Fig. 53.)

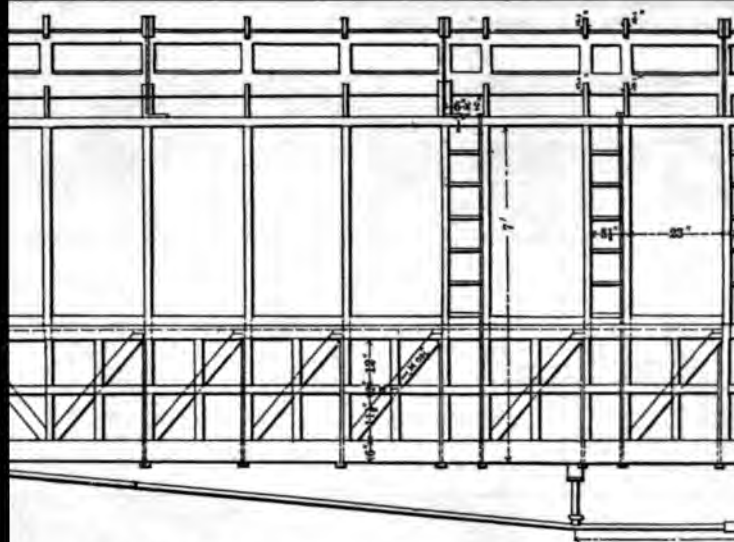


Fig. 161. Framing.

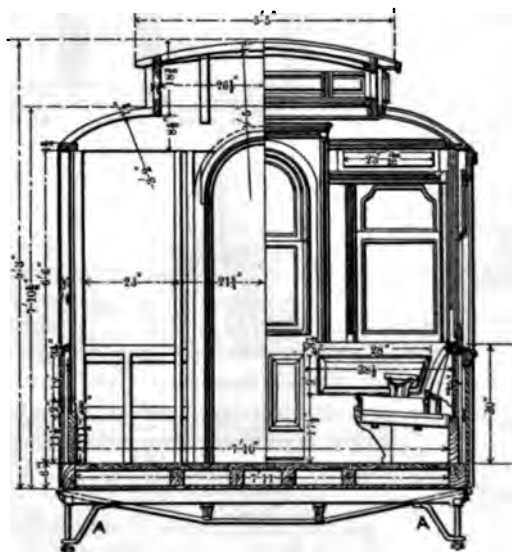
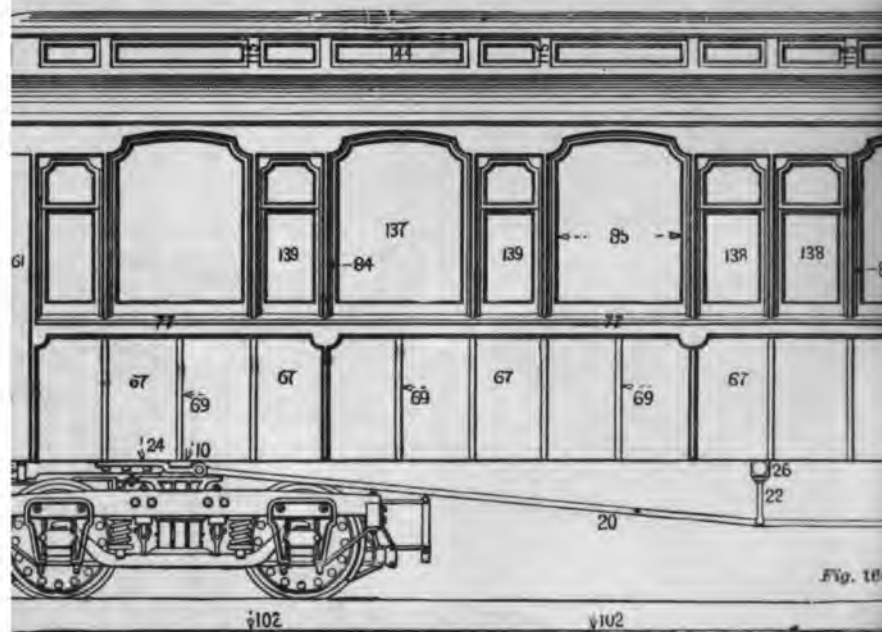


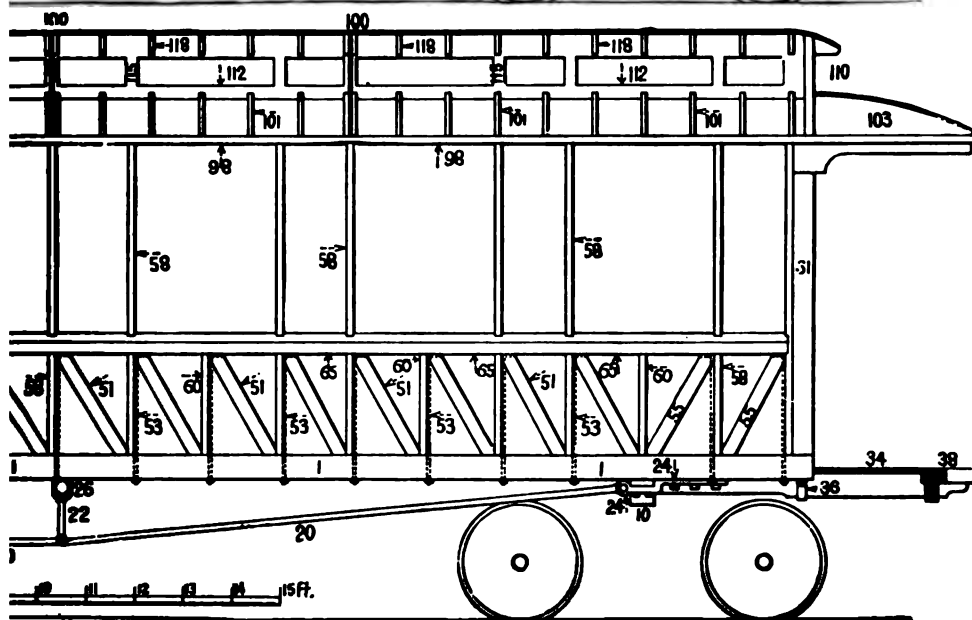
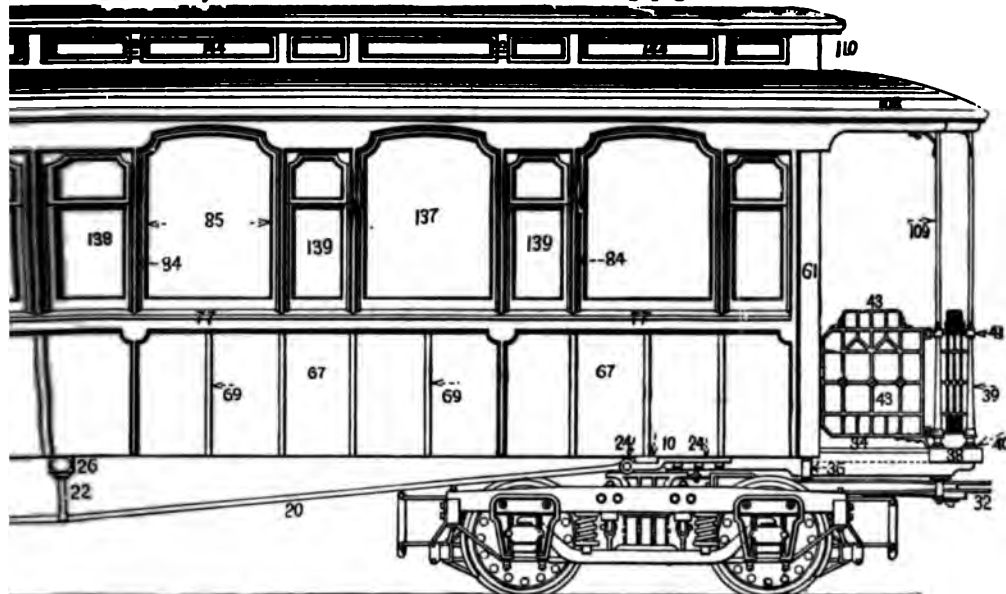
Fig. 163.

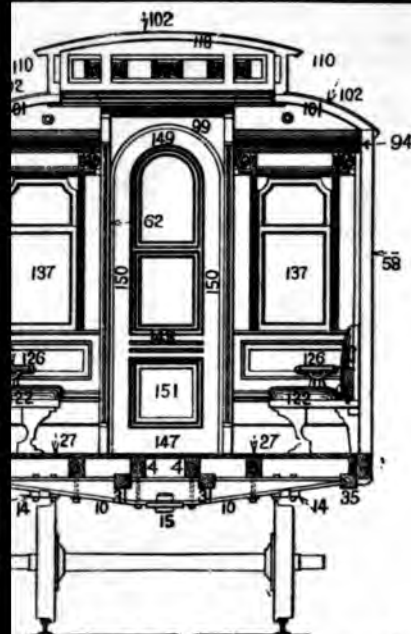
Transverse Section.(Scale: $\frac{1}{4}$ inch to a foot.)PASSENGER CAR-BODY (*New Standard*) MANHATTAN ELEVATED RAILROAD, OF NEW YORK.*A. Body Queen-post Stay.*

(Names of the various parts are practically the same as in the old standard, Figs. 164-168, on the following pages; the designs differing chiefly in style of finish; notably in respect to the windows and seats. The framing is practically identical in style. Consequently reference numbers to the various parts have not been added.)



Numbers refer to List of Names of Parts on following page.





PASSENGER CAR-BODY MANHATTAN ELEVATED RAILROAD (Old Standard).

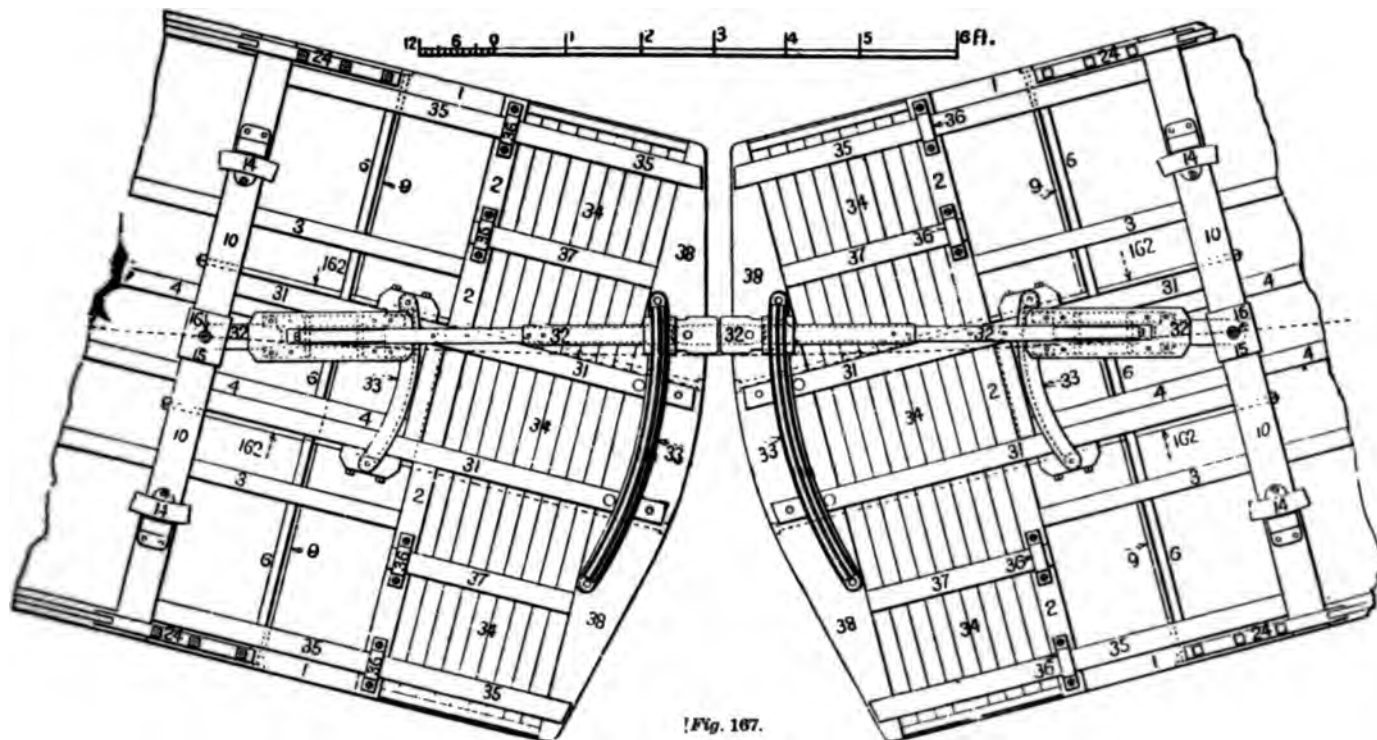


Fig. 167.

Inverted Plan (on maximum curve of 90 ft. radius).

Figs. 167-168. DRAW-GEAR OF PASSENGER CAR, MANHATTAN ELEVATED RAILROAD OF NEW YORK.

NAMES OF PARTS: Figs. 167-168.

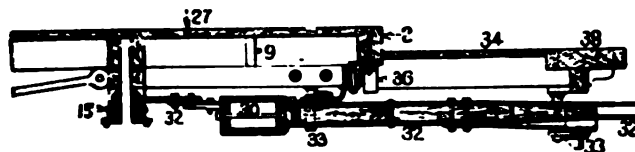


Fig. 168.

Longitudinal section of draw-bar (on tangent).

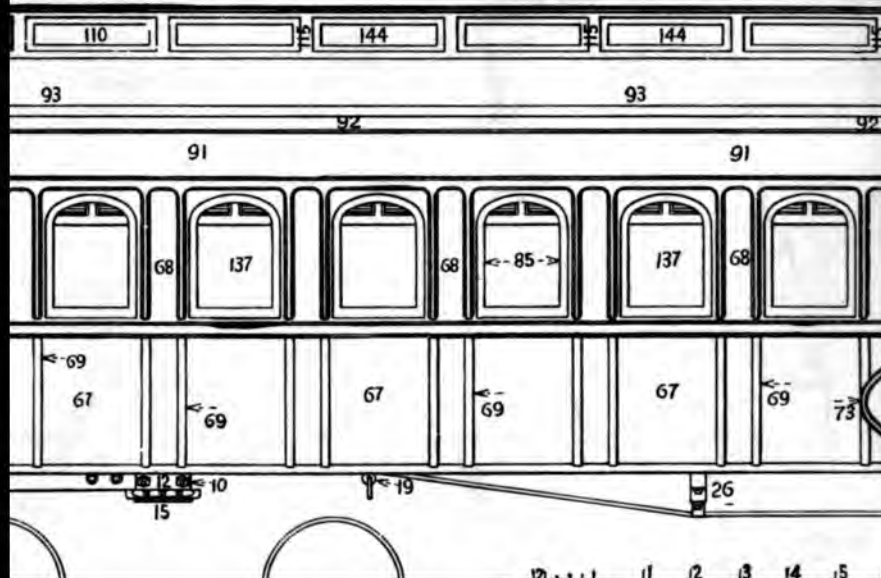
- | | |
|-------------------------------|--|
| 1. Side-sills. | 30. Draw-spring. |
| 2. End-sills. | 31. Draw-timbers. |
| 3. Intermediate-sills. | 32. Centre-draft Drawbar. |
| 4. Centre-sills. | 33. Drawbar Sector. |
| 5. Bridging. | 34. Platform, Platform-floor. |
| 9. Sill Tie-rod. | 35. Platform-sills. |
| 10. Body-bolster. | 36. Platform-timber Clamps. |
| 14. Body Side-bearings. | 37. Platform Short-sills. |
| 15. Body Centre-plate. | 38. Platform End-timber, or Buffer-beam. |
| 16. King-bolt. | 162. Platform Tie-rod. |
| 24. Trans-rod Iron. | |
| 27. Main Floor, or Car Floor. | |

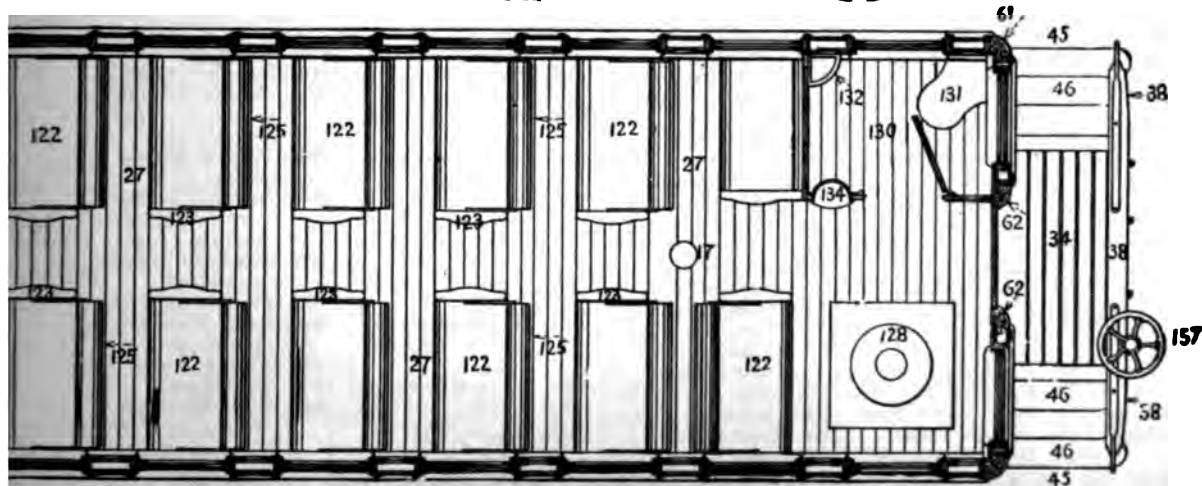
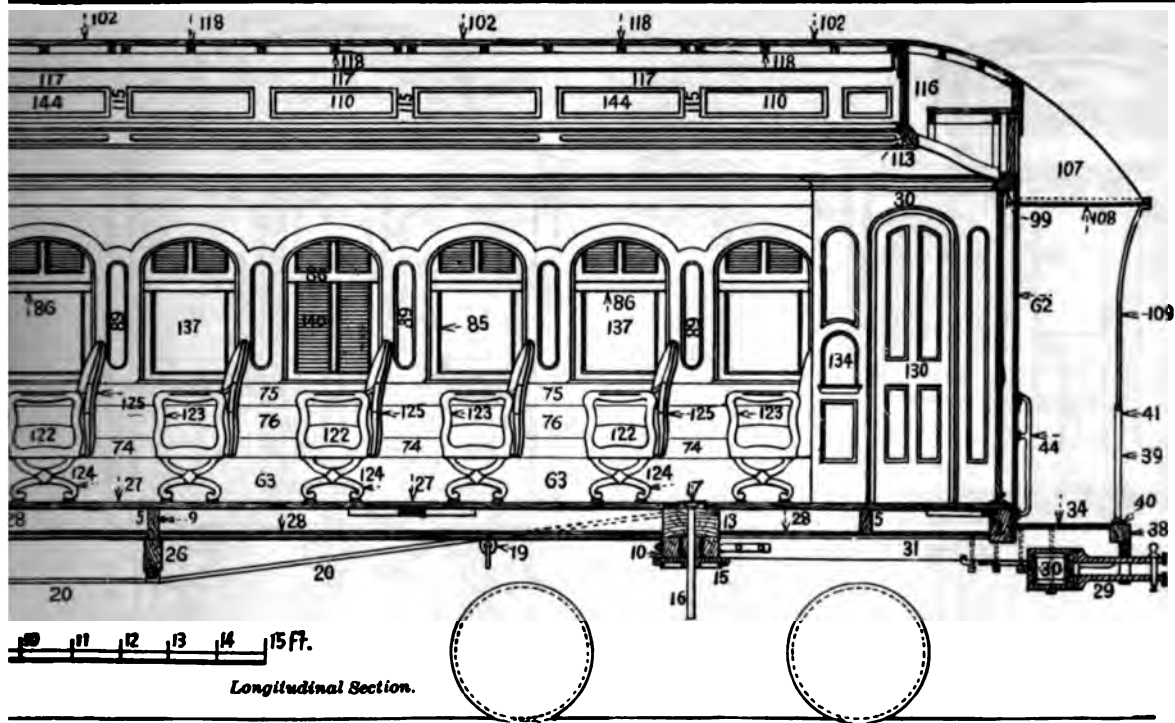
(Parts numbered 32, 33 are special to this style of car, and not used elsewhere.)

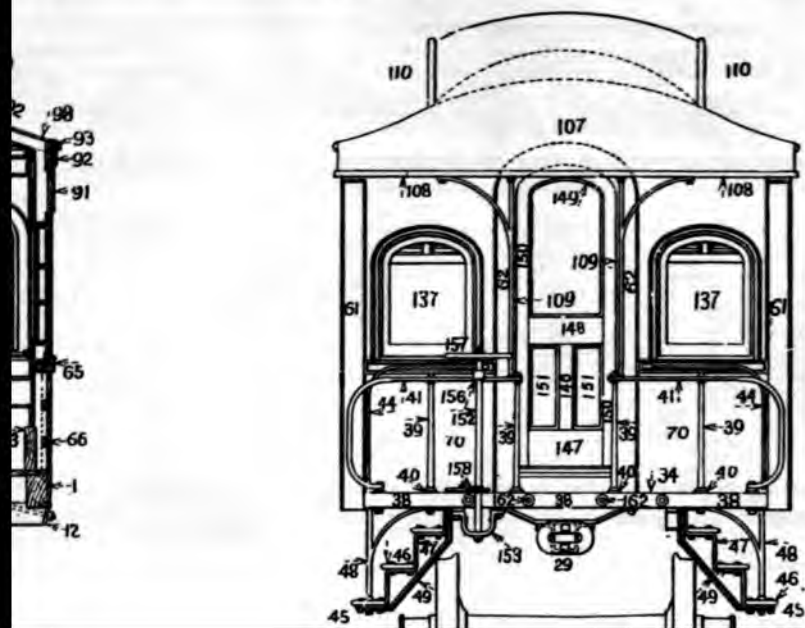
ager Day Coaches.

E 70

Numbers refer to List of Names of Parts on following page.







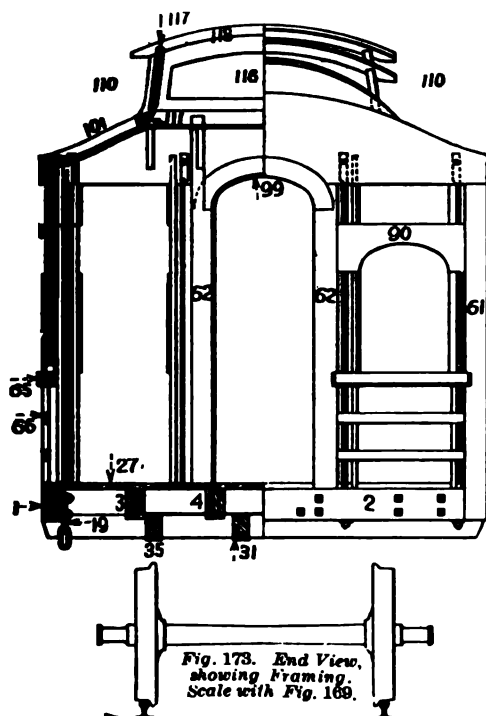


Fig. 173. End View, showing Framing. Scale with Fig. 169.

PASSENGER CAR-BODY
(Old Standard)
PENNSYLVANIA RAILROAD.
(New Standard, Figs. 178-185).

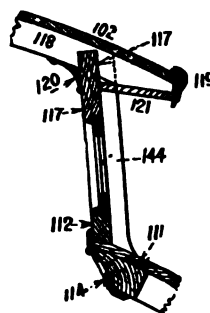


Fig. 174.
Section of Side of Clear story.

(A section of the new standard passenger car superseding this design is shown in Fig. 180. Also, one showing a different style of construction, with Challender Truss and Wilson Flexible Window Blind, in Figs. 185a and 185b.)

(Continued from preceding page.)

- 93. Eaves-moulding.
- 94. Inside-cornice.
- 95. Inside-cornice Fascia-board.
- 96. Inside-cornice Sub-fascia-board.
- 97. Inside lining.
- 98. Plate.
- 99. Door-lintel.
- 100. Carline, or Compound-carline.
- 101. Rafter.
- 102. Roof-boards.
- 107. Platform-hood.
- 108. Platform-hood Box.
- 109. Platform-hood Post.
- 110. Clear-story or Upper Deck.
- 111. Deck Sill.

- 112. Deck Bottom-rail.
- 113. Deck End-sill.
- 114. Deck-sill Facing.
- 115. Deck Post.
- 116. Deck End-panel or Ventilator.
- 117. Deck-plate.
- 118. Upper-deck Carline.
- 119. Upper-deck Eaves Moulding.
- 120. Deck Inside Cornice.
- 121. Deck Soffit-board.
- 122. Car Seat.
- 123. Seat-end, or Aisle Seat-end.
- 124. Seat-stand.
- 125. Seat back.
- 128. Stove, or Heater.
- 130. Saloon.
- 131. Closet Hopper.

- 132. Urinal.
- 134. Water-alcove.
- 137. Window.
- 140. Window-blind.
- 144. Deck-sash, or Window.
- 146. Door-mullion.
- 147. Bottom-rail, of Door.
- 148. Middle Door-rail.
- 149. Top-rail, of Door.
- 150. Door-stile.
- 151. Door-panel.
- 152. Brake-shaft.
- 153. Brake-shaft Step.
- 156. Upper Brake-shaft Bearing.
- 157. Brake-wheel.
- 158. Brake Ratchet-wheel.
- 161. Flag-holder Plate.
- 162. Platform Tie-rod.

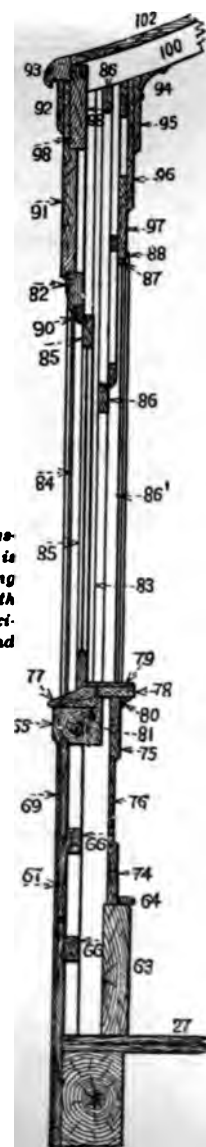


Fig. 175.
Section of Side through Window.

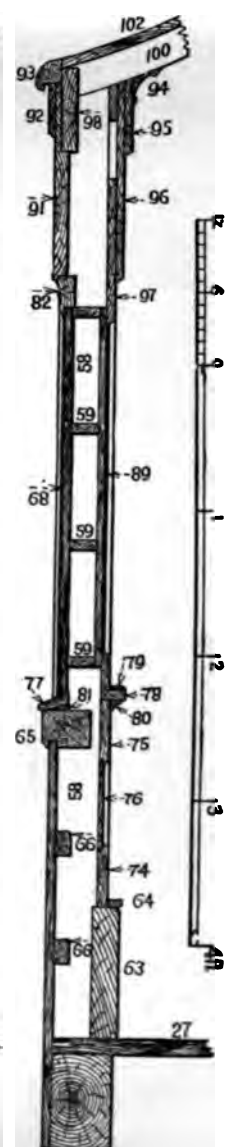


Fig. 176.
Section of Side between Windows.

ger; Day Coaches.

E74

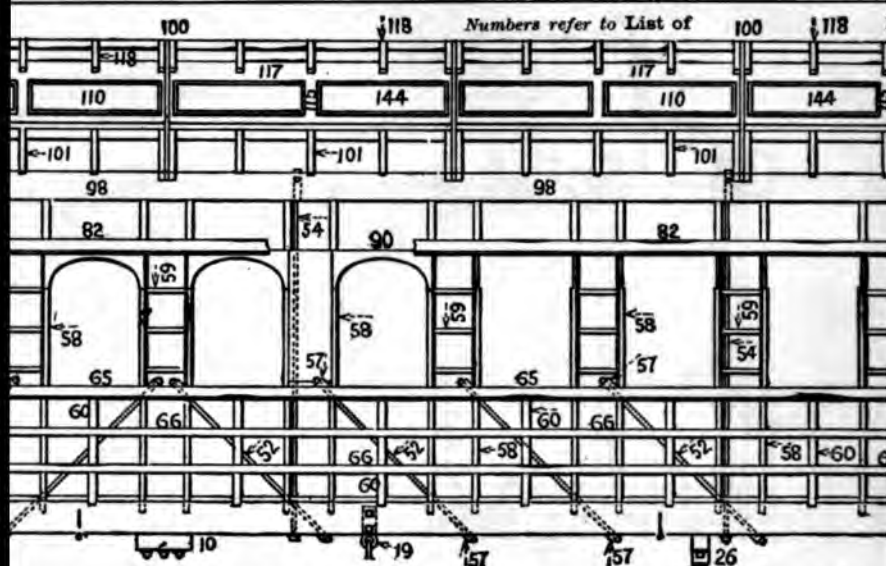
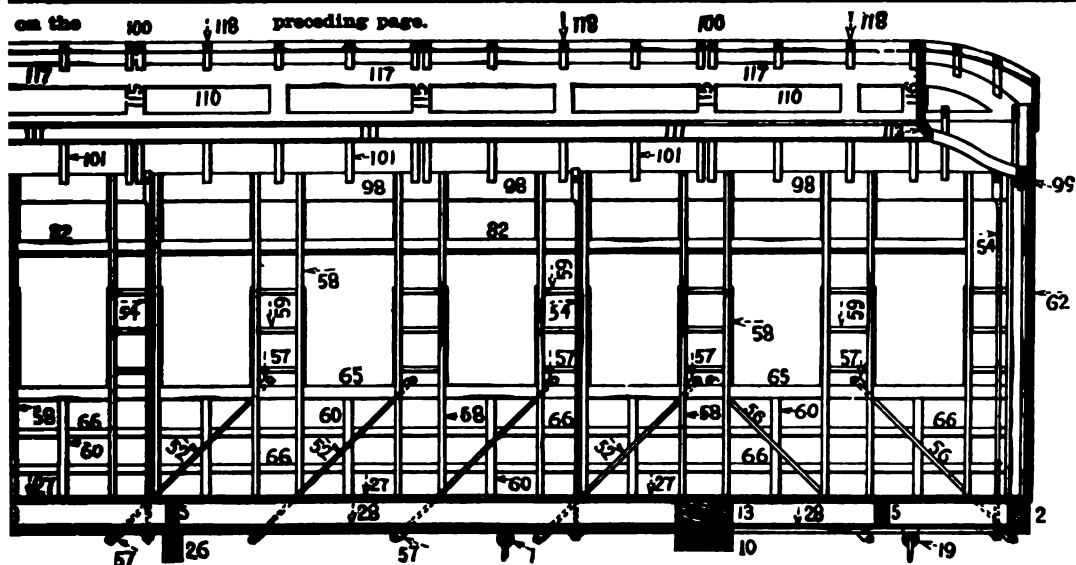


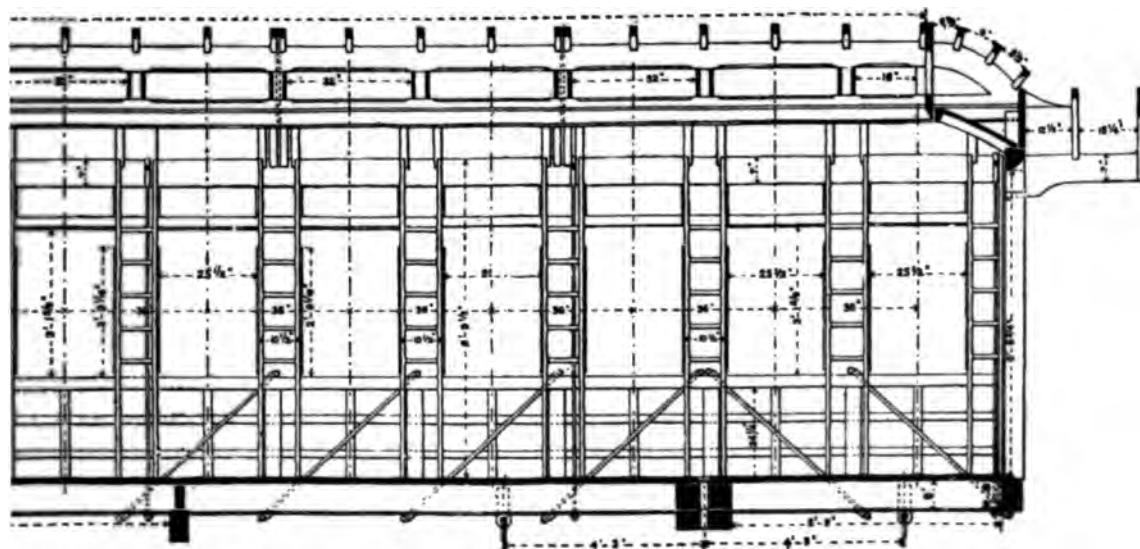
Fig. 177. PASSENGER CAR-B
(8)

42 feet 5 in. Length of Deck in



1, PENNSYLVANIA RAILROAD.

)



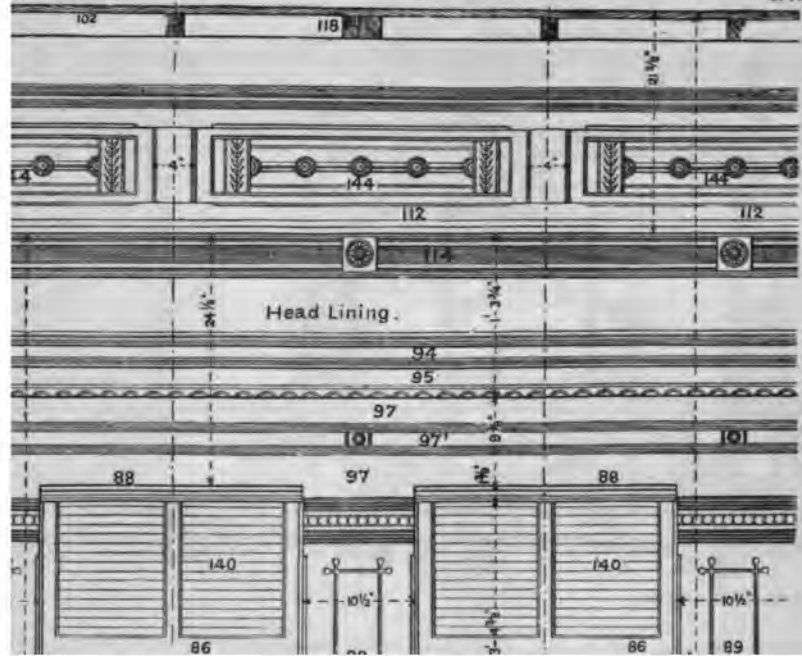
(standard). PENNSYLVANIA RAILROAD.

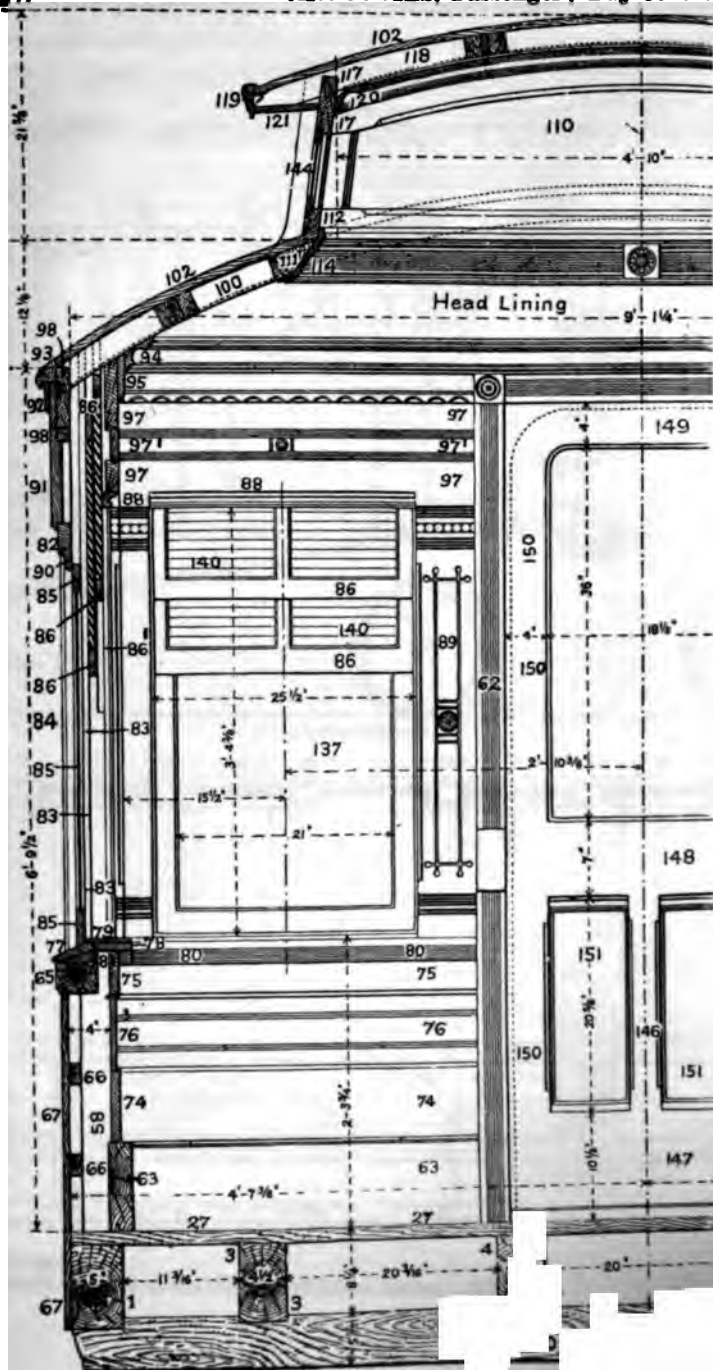
's PLATFORM-ROOF for a PLATFORM-ROOF. See Dictionary.)

Longitudinal Section, showing Framing

y Coaches.

E 76





PASSENGER CAR-BODY
(New Standard),
PENNSYLVANIA RAILROAD.
(Old Standard, Figs. 169-171.)

LIST OF NAMES OF PARTS; Figs. 179-180.

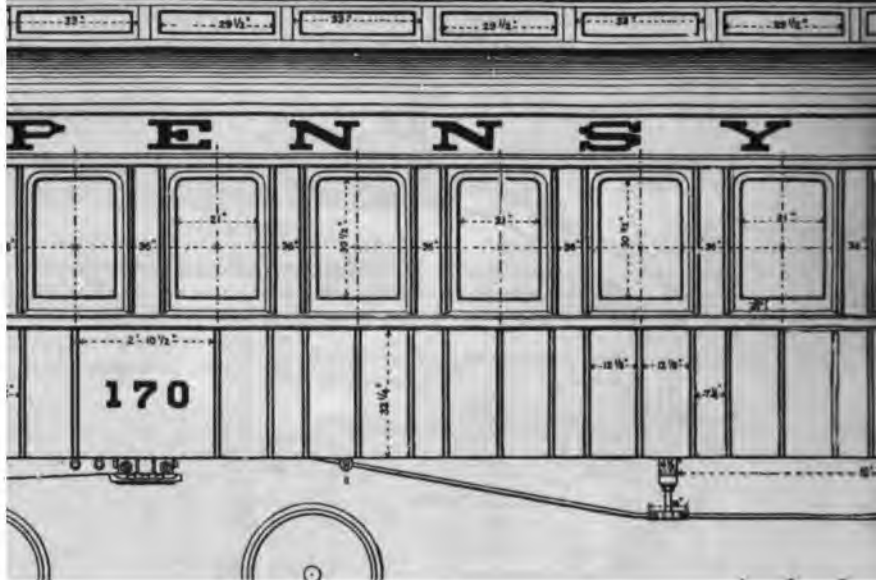
(Continued from preceding page.)

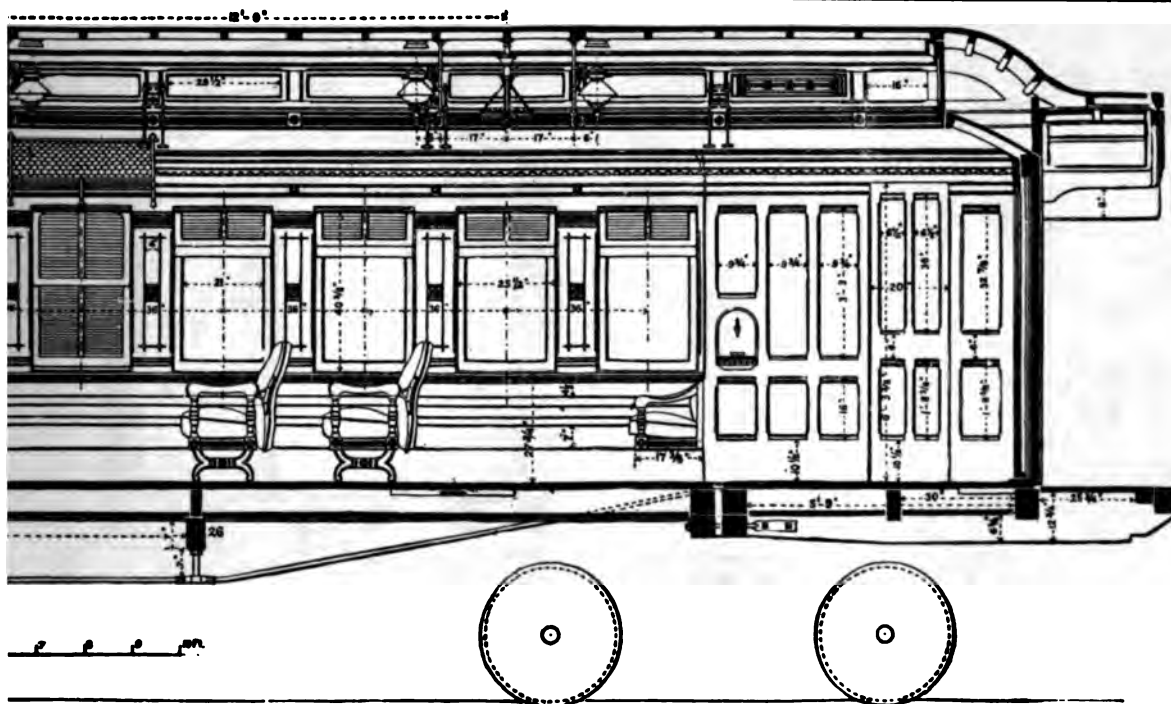
- 92. Eaves Fascia-board.
- 93. Eaves-moulding.
- 94. Inside-cornice
- 95. Inside cornice Fascia-board.
- 97. Inside-lining.
- 97'. Belt-moulding.
- 98. Plate.
- 100. Carline, or Compound Carline.
- 102. Roof-boards.
- 110. Clear-story, or Upper Deck
- 111. Deck Sill.
- 112. Deck Bottom-rail.
- 114. Deck-sill Facing.
- 117. Deck Plate.
- 118. Upper-deck Carline.
- 119. Upper-deck Eaves-moulding.
- 120. Deck Inside-cornice.
- 121. Deck Soffit-board.
- 122. Car Seat.
- 123. Seat-end, or Aisle Seat-end.
- 124. Seat-stand.
- 125. Seat-back.
- 127. Foot-rest.
- 137. Window.
- 140. Window blind (lower and upper).
- 144. Deck Sash, or Window.
- 147. Bottom-rail, of Door.
- 148. Middle Door-rail.
- 149. Top-rail, of Door.
- 150. Door-stile.
- 151. Door-panel.

(A different style of construction, with Challenger Truss and Wilson Flexible Window Blinds, is shown in Figs. 180a and 180b. See, also, section of side of old Pennsylvania standard, Figs. 175-B.)

Day Coaches.

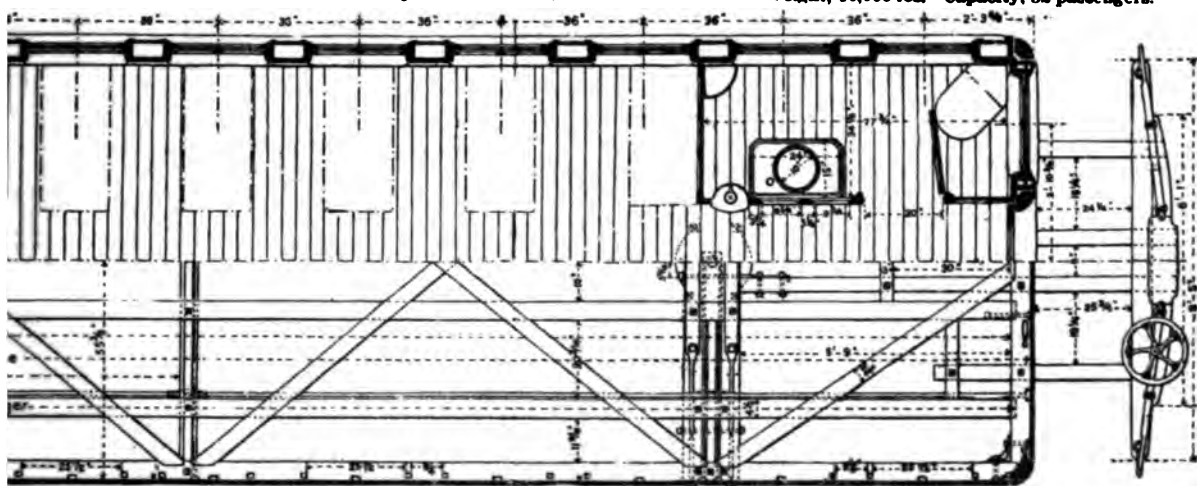
E 78





Longitudinal Section.

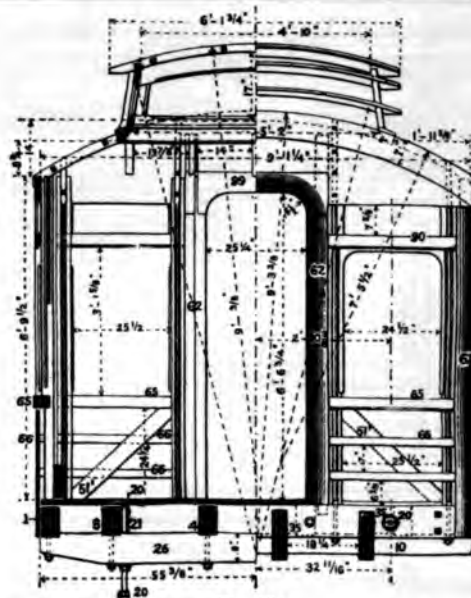
Weight, 42,000 lbs. Capacity, 52 passengers.



USE, PENNSYLVANIA RAILROAD.

For details of this car, see CAR-BODY DETAILS and FURNISHINGS.)

Scale with Fig. 181.



PASSENGER CAR-BODY
(New Standard),
PENNSYLVANIA RAILROAD.
(Old Standard, Figs. 169-177.)

Fig. 184. Cross-section through
Window, Cross-section through
Platform.

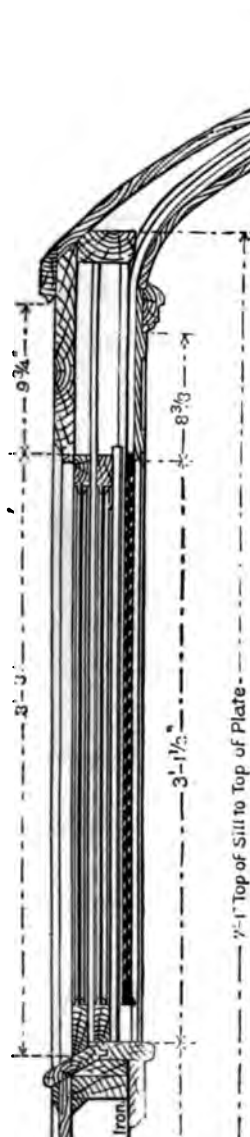


Fig. 185a.
WILSON FLEXIBLE WINDOW-BLIND (also
shown in detail in Figs. 1646-7.)

Numbers refer to List of Names of Parts on previous page.

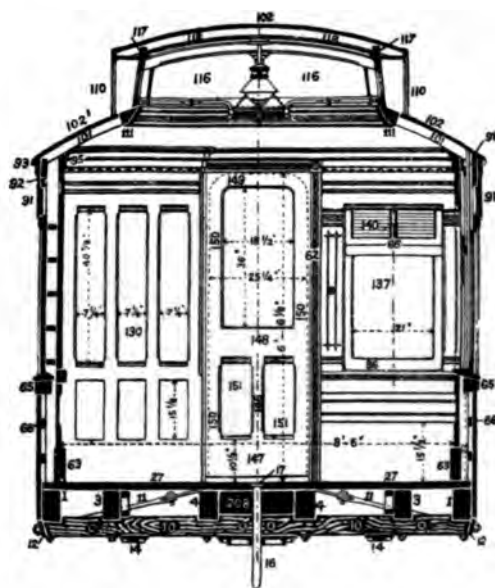


Fig. 185.
Transverse Section and Interior End View.
PASSENGER CAR-BODY (New Standard) PENNSYLVANIA
RAILROAD.

Figs. 185a and b.
CROSS-SECTIONS OF SIDE OF DINING CAR "KANSAS CITY"
(shown in Plan and Elevation, with other details in Figs.
191-194), showing WILSON FLEXIBLE WINDOW-BLIND AND
CHALLENGER TRUSS.

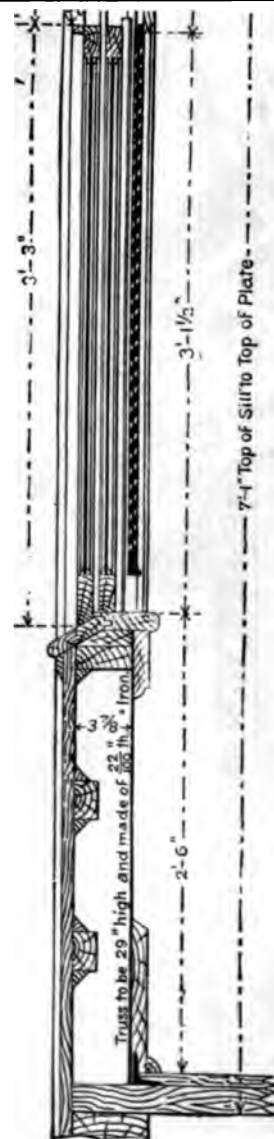


Fig. 185b.
CHALLENGER TRUSS.



NAMES OF PARTS, Fig. 186.

(Numbers in parentheses refer to corresponding parts in Figs. 154-183, notably Figs. 175-180.)

1. Roof-boards, Upper Deck.
2. } Deck Bridging.
3. }
4. (117) Deck Plate.
5. Deck-sash Lintel.
6. (15) Deck-sash Post.
7. Compound Carlin.
8. Upper-deck Carlin.
9. Platform-hood Ceiling.
10. Platform-hood Side-piece.
11. End Roof-panel.
12. Furring-blocks.
13. (112) Lower Deck-rail.
14. Roof-strip (upper).
15. } (101) Rafter.
16. }
17. Roof-stain (lower).



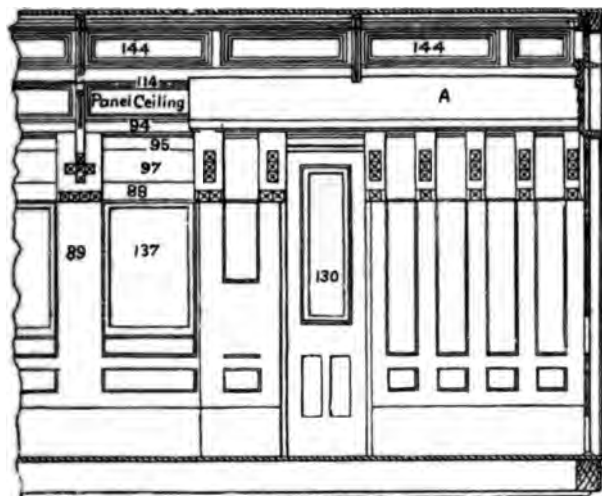


Fig. 188. Side View of interior finish near Saloon.

ROUND-CORNERED
PASSENGER CAR,
PHILADELPHIA & READING
RAILROAD; with
"A" ROOF.

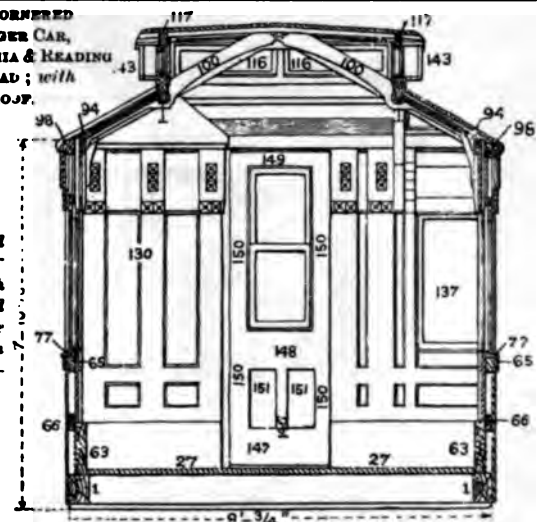


Fig. 189. Transverse Section, giving Interior End Elevation.

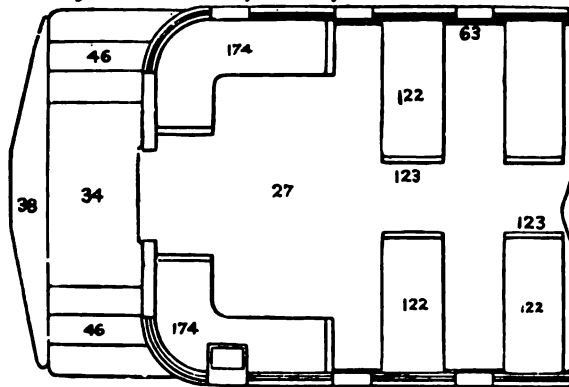
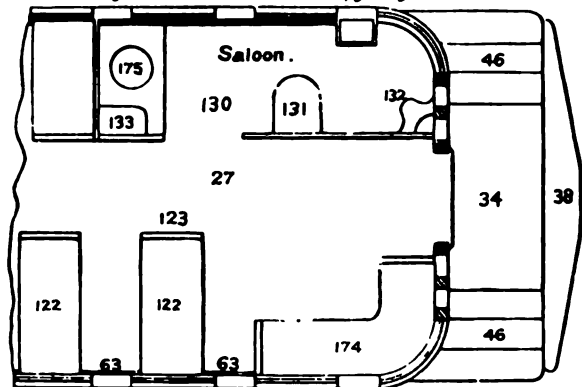


Fig. 190. Plan.



NAMES OF PARTS; Figs 187-190.

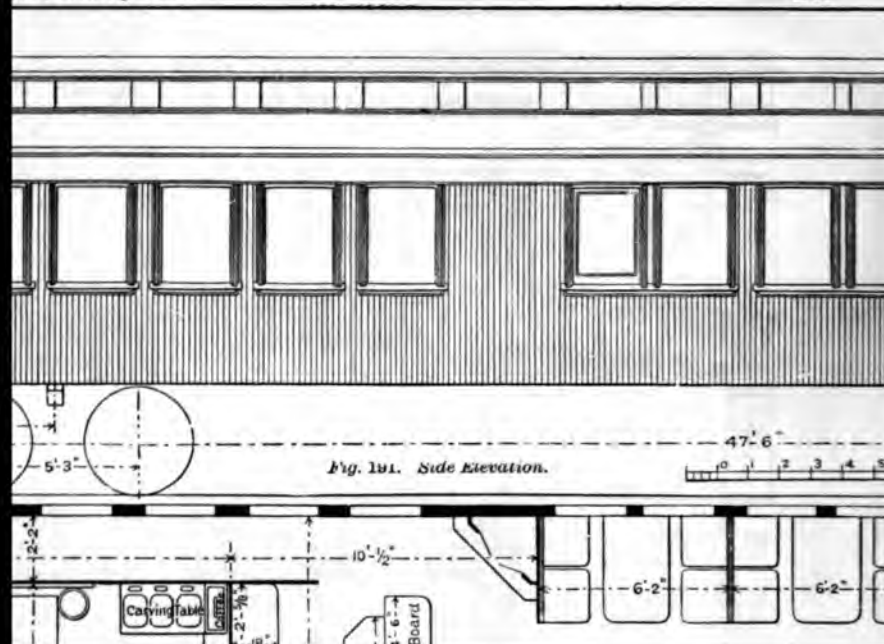
A. Saloon Roof.

1. Side sills.
27. Main Floor, or Car Floor.
34. Platform, Platform-floor.
38. Platform End-timber, or Buffer-beam.
46. Tread-board.
63. Truss-plank.
65. Belt-rail.
66. Panel-rail.
77. Outside Window-sill.

88. Window moulding.
89. Inside Window-panel.
94. Inside-cornice.
95. Inside-cornice Fascia-board.
97. Inside-lining.
98. Plate.
100. Carline, or Compound-carline.
114. Deck-sill Facing.

116. Deck End-panel, or Ventilator.
117. Deck plate.
122. Car-seat.
123. Seat-end, or Aisle Seat-end.
130. Saloon.
131. Closet Hopper.
132. Urinal.
133. Water-cooler.

137. Window.
143. Deck Side Ventilator.
148. Door-mullion.
147. Bottom-rail, of Door.
149. Middle Door-rail.
149. Top-rail, of Door.
150. Door-stile.
151. Door-panel.
174. Round-corner Seat.
175. Wash-basin.



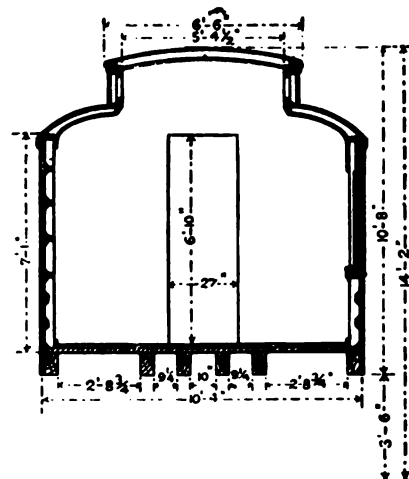
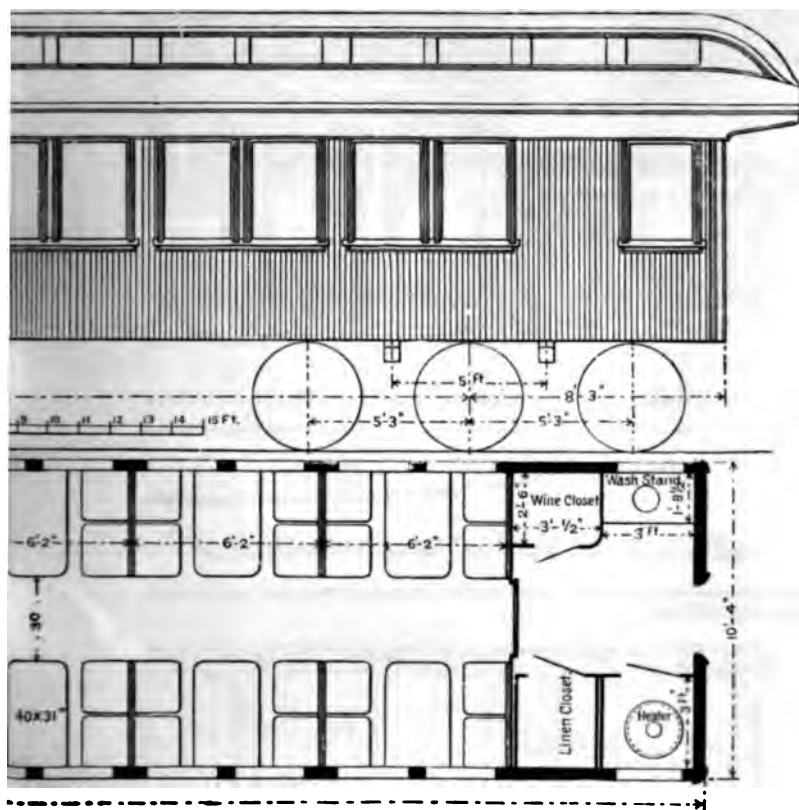


Fig. 192.

Section, giving general dimensions.

(Sections of the side of this car to a larger scale, showing Challenger Truss and Wilson Flexible Window Blinds, are shown in Figs. 185a and 185b.)

DINING CAR "KANSAS CITY." CHICAGO, BURLINGTON & QUINCY RAILROAD.
WITH THEATRE SEATS, CHALLENGER TRUSS AND WILSON FLEXIBLE WINDOW BLINDS.

Fig. 194.

Elevation, showing style of window finish.

94. CAR-BODIES, Passenger; Dining Cars.

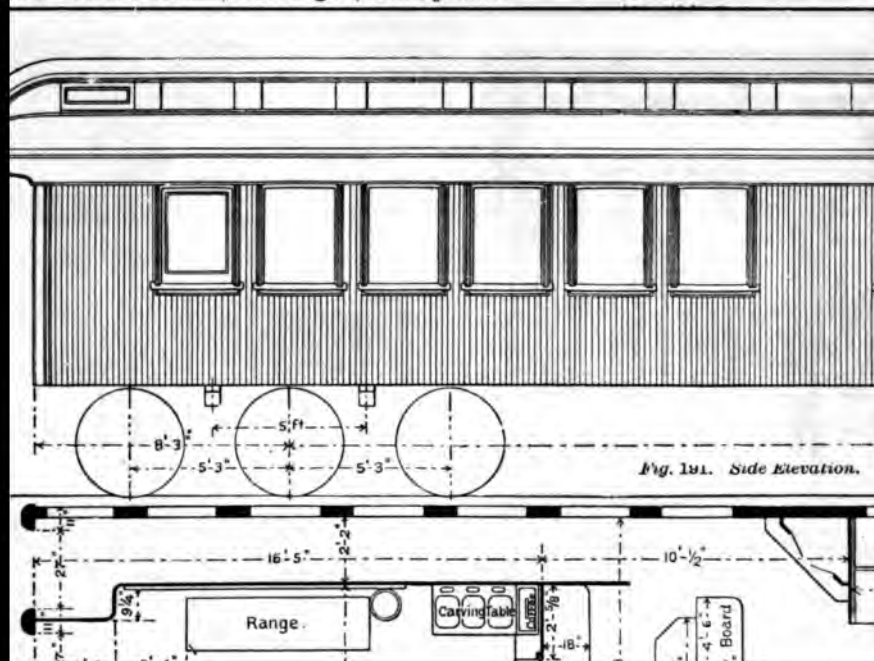


Fig. 191. Side Elevation.

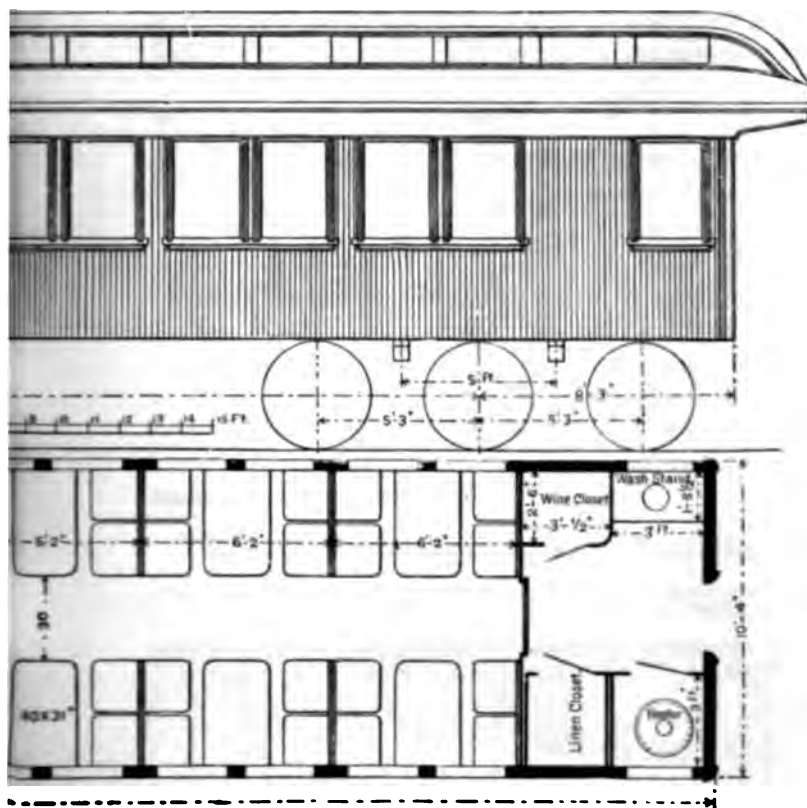


Fig. 194.

Elevation, showing style of window finish.

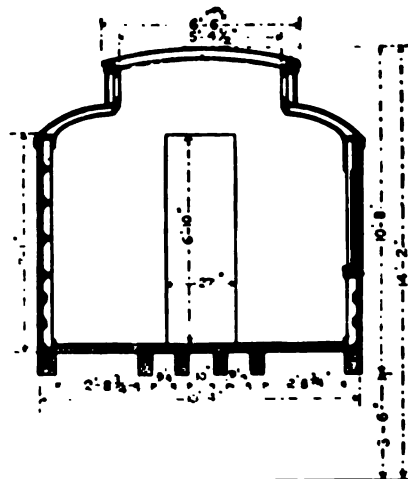


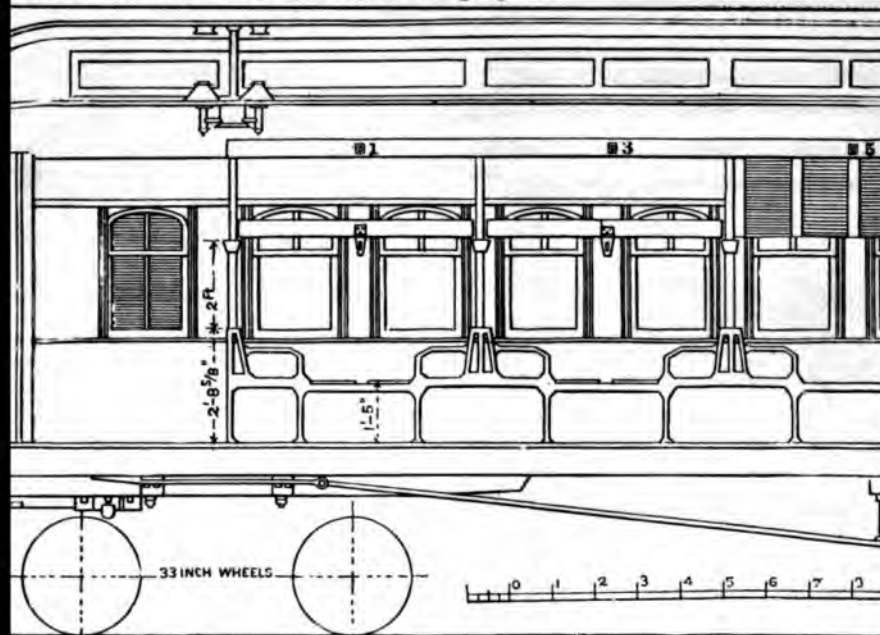
Fig. 192.

Section, giving general dimensions.

(Sections of the side of this car to a larger scale, showing Challenger Truss and Wilson Flexible Window Blinds, are shown in Figs. 195a and 195b.)

DINING CAR "KANSAS CITY," CHICAGO, BURLINGTON & QUINCY RAILROAD.
WITH THEATRE SEATS, CHALLENGER TRUSS AND WILSON FLEXIBLE WINDOW BLINDS.

CAR-BODIES, Passenger ; *Emigrant Sleeping Car*



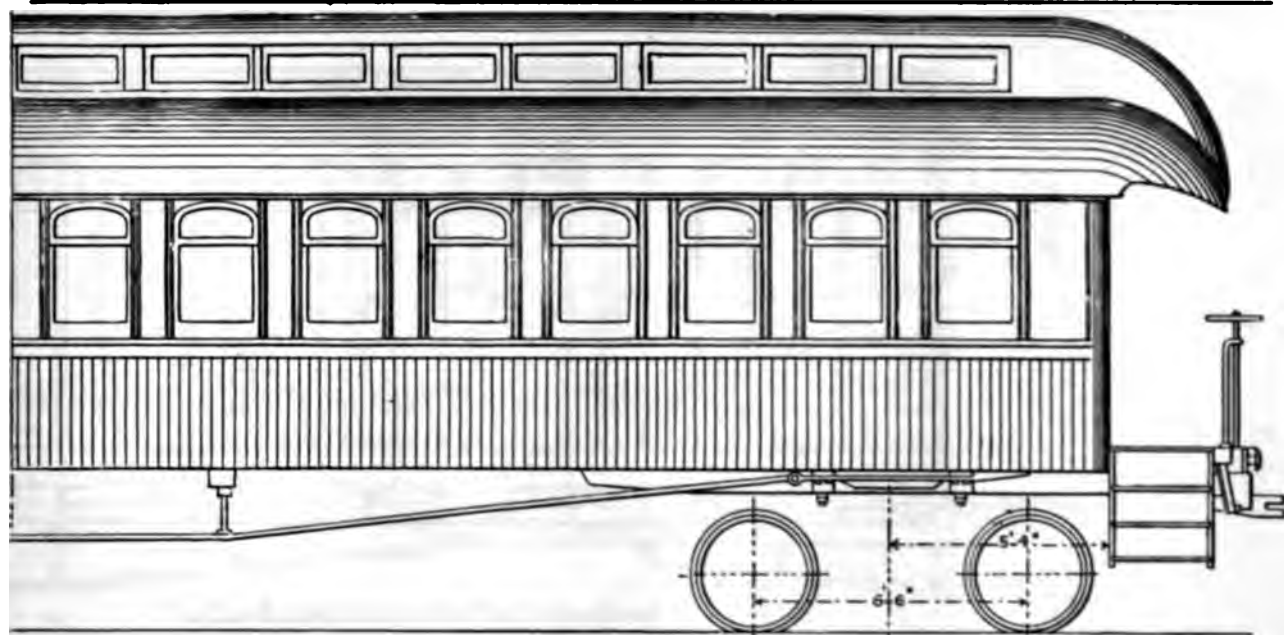
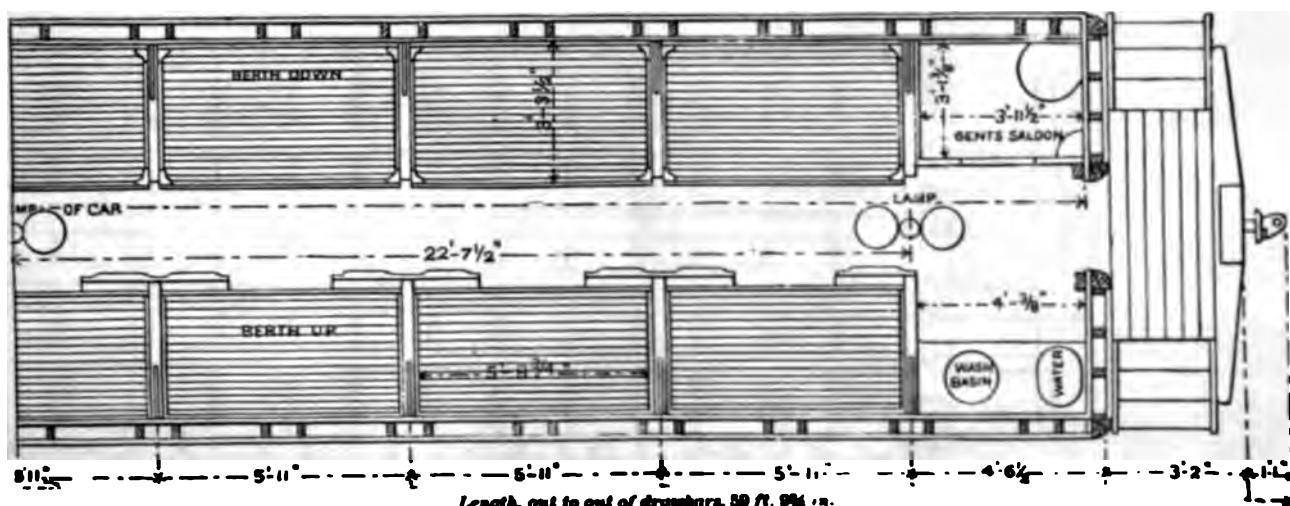


Fig. 197. Elevation.

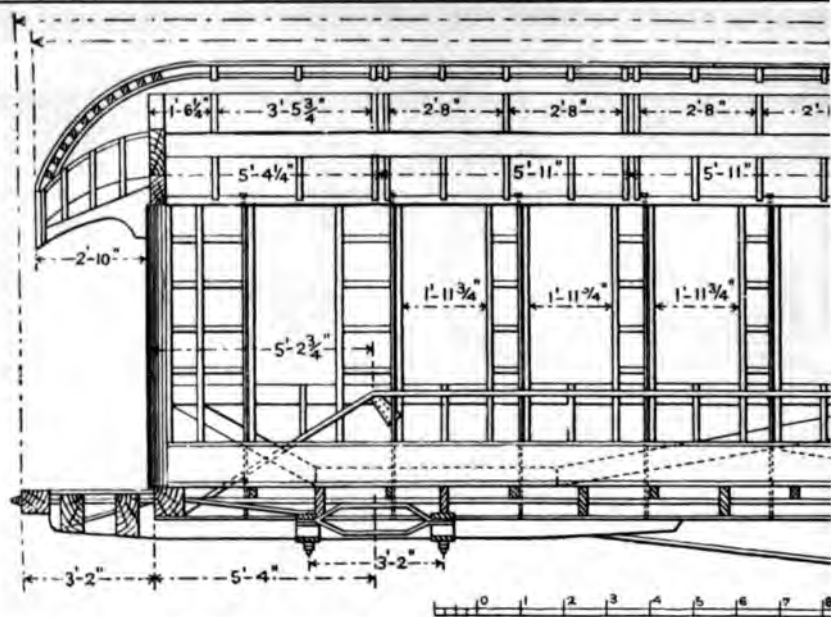


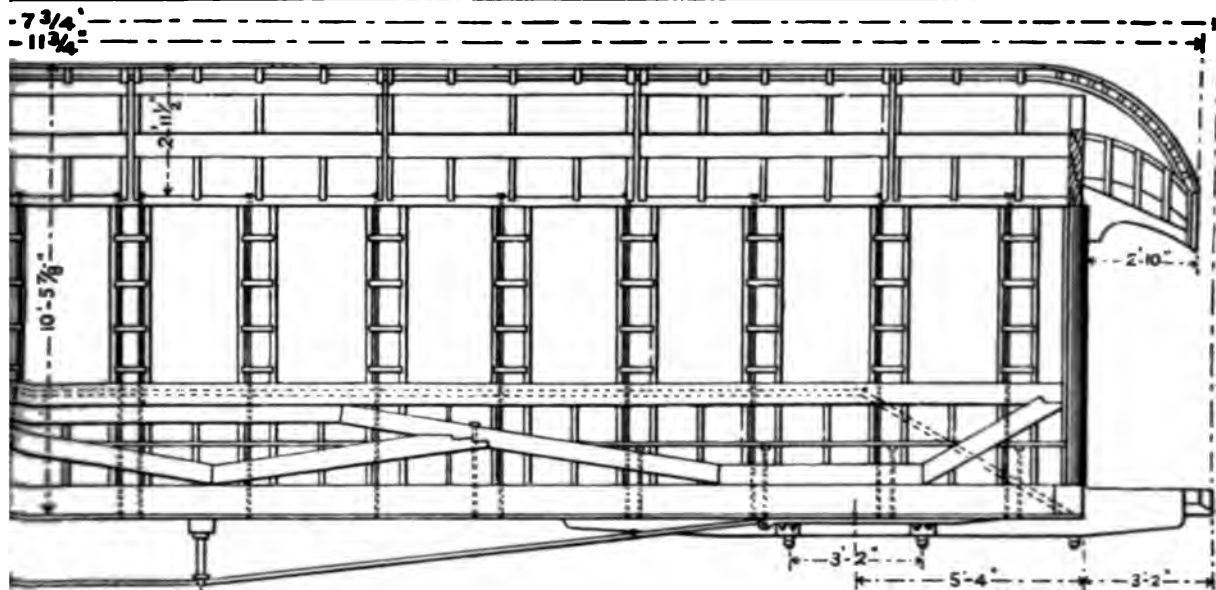
Length, out to out of drawbars, 59 ft. 9 1/4 in.

Fig. 198. Plan.

EMIGRANT SLEEPING CAR, UNION PACIFIC RAILROAD.

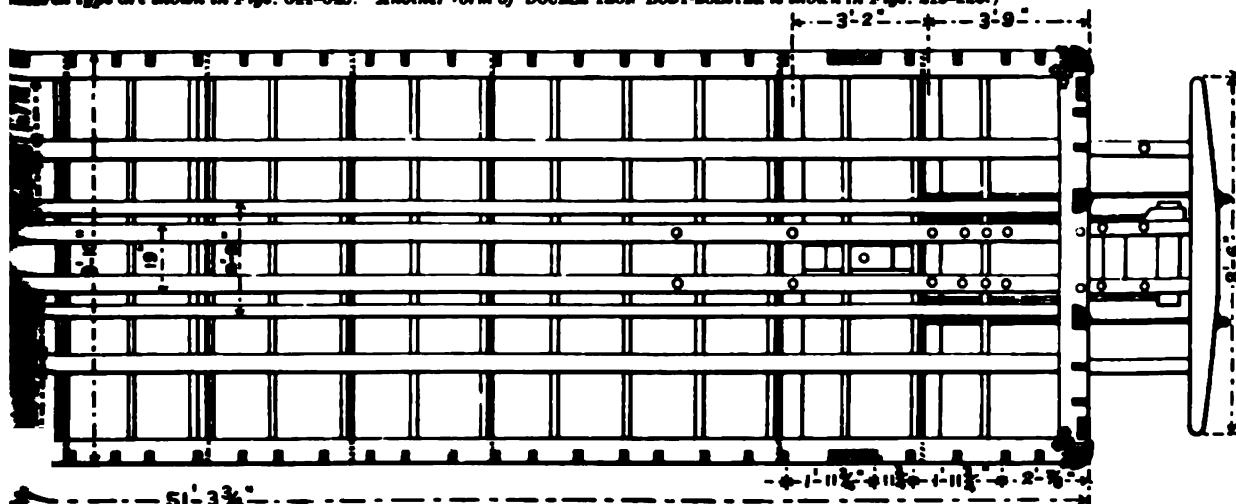
99-200. CAR-BODIES, Passenger; *Emigrant Sleeping Car.*





SHOW BODY-BOLSTER AND INTERMEDIATE FLOOR.

Several types are shown in Figs. 644-645. Another form of DOUBLE IRON BODY-BOLSTER is shown in Figs. 219-220.)



Framing.

PACIFIC RAILROAD.

203. CAR-BODIES, Passenger; *Emigrant Sleeping Car.*

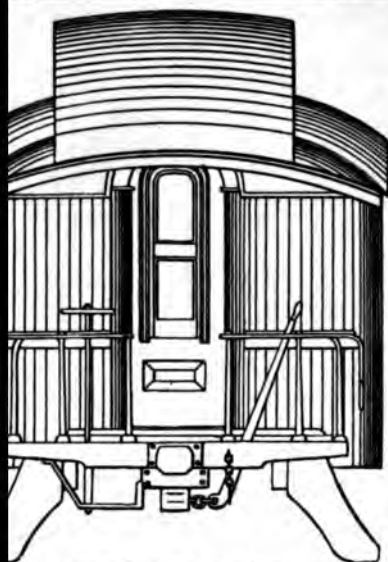


Fig. 201. End Elevation.

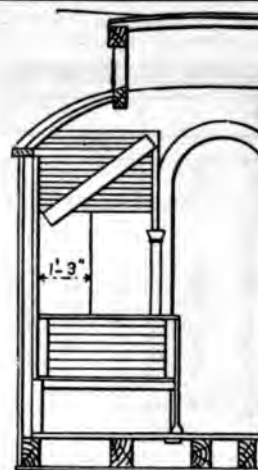


Fig. 202. Section showing b

EMIGRANT SLEEPING CAR, UNION PACIFIC RAILROAD.

LIST OF NAMES OF PARTS;
Figs. 204-7.

(Continued from previous page).

48. Buffer-rod.
49. Buffer-rod Guide, or Buffer Block.
50. Buffer-rod Shoe.
51. Plate, or Laminated Buffering and Draw-spring.
52. Auxiliary Draw-spring (rubber). [Batten.
66. Floor Board, or Floor
63. Headstock and Diagonal Knee.
64. Spring-link, or Spring Shackle.
65. Spring-link Adjusting-screw, or Tee-bolt.
66. Spring-link Adjusting-screw (special pattern).
67. Auxiliary Rubber Bearing-spring.
68. Scroll-iron, or Spring Hanger.
69. End Scroll-iron.
90. Scroll-iron (special pattern).
91. Bottom-side.
92. Bottom End-piece, or Bottom End-bar.
93. Bottom Cross-piece, or Bottom Crossbar.
94. Corner-pillar.
95. Standing, Intermediate, or Partition Pillar.
96. Doorway Pillar.
97. End Pillar.
98. Cant-rail.
99. End Arch-rail.
100. Waist-rail.
101. Elbow-rail.
102. Bottom Light-rail.
103. Top Light-rail.
104. Front Seat-rail.
105. Bottom Panel-batten.
106. End-rail.
107. Top Panel-batten.
108. Elbow-rail.
109. Door-panel Batten.
110. Quarterlight Pillar.
111. Door Garnish-rail.
112. Door Bottom Ventilator-rail.
113. Door Top-rail.
114. Door Bottom-rail.
115. Door Glass-frame Stop-rail.
116. Fall-under, or Turn-under.
117. Side Top-panel Rail.
118. Door Fence-rail.
119. Seat-rail Support.
120. Roofstick, or Hoopstick. [Bead Moulding.
121. Planted Moulding, or
122. Wrought Moulding, or Fascia Moulding.
123. Bottom Side-panel.
124. Waist-panel.
125. Quarter-panel.
126. Quarterlight-panel.
127. End-panel.
128. Bottom Door-panel.
129. Inside Casing, or Inside Lining.
130. Partition.
131. Roof-board.
132. Side Gutter, or Outside Cornice.
133. Side-gutter, or Outside Cornice Moulding.
134. Ventilator Hood, or Coal.
135. Ventilator Sliding-panel.
136. Ventilator Fixed-panel.
137. Quarter-light, or Side-light (fixed).
138. Door light (falling).
139. Door Pillar or Door Stile.
140. Door-tight Bottom Sash-rail, or Glass-frame Bottom Sash-rail.
141. Door-tight Stile, or Glass-frame Stile.
142. Quarter-light Moulding, or Glass-frame Stile.
143. Outer Double Floor, or Floor Underlining.
144. Bottom-side and End Knee.
145. Draw-hook Washer, or Drawbar Front-plate.
146. Draw-spring Cradle-plate.
150. Seat-board.
151. Cushion Back-rail.
152. Back Seat Rail.
160. Lamp Case.
161. Lamp-cover, or Lamp Protector.
162. Lamp-plug.
163. Lamp-plug Stand.
164. Lamp-cover Spring-catch.
165. Lamp-burner.
166. Lamp-glass.
167. Lamp-case Base, or Packing.
168. Inner Lamp-ring.
170. Communication cord Pulley.
171. Lower Foot board.
172. Upper Foot-board (continuous).
173. Step-iron, or Leg-iron.
174. End Ascending-step.
175. End Ascending-rail.
176. Roof Ascending-rail, or Roof Commode-handle.
177. Commode-handle.
178. Upper Door-hinge.
179. Centre Door-hinge and Stop (Cross' Patent).
180. Lower Door-hinge.
181. Door-handle.
182. Private Lock. [Bracket.
183. Destination-board.
184. Side Lamp-iron.
185. End Lamp-iron.
186. India-rubber Body-cushion, or Attock's Body-block.
187. Body Holding-down Bolt.

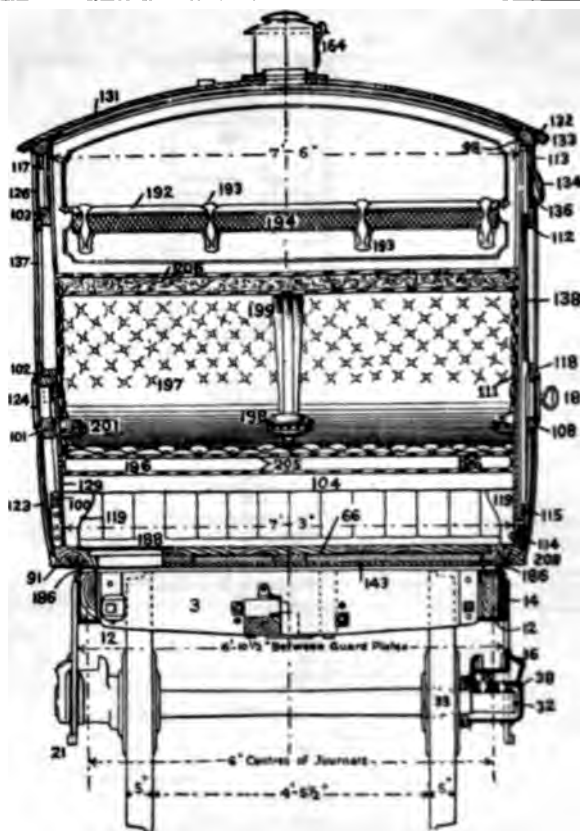


Fig. 204. SECTION OF ENGLISH RAILWAY CARRIAGE.
(See following page.)

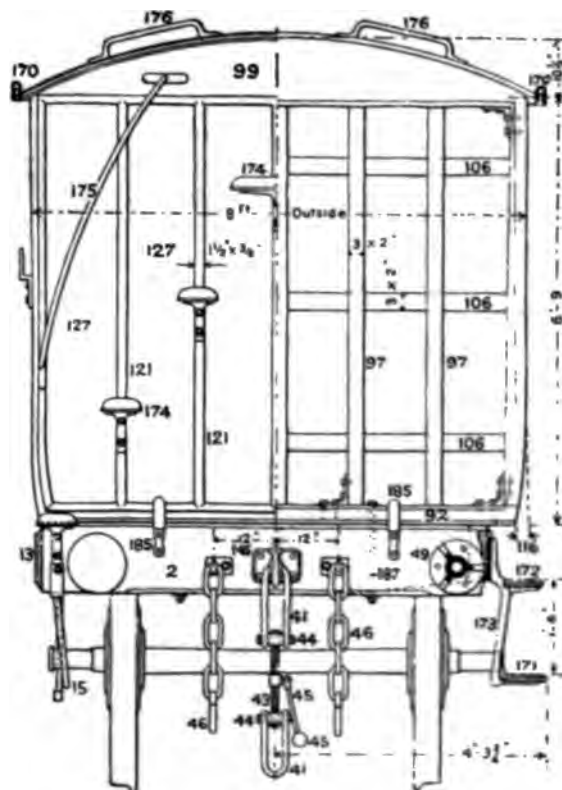
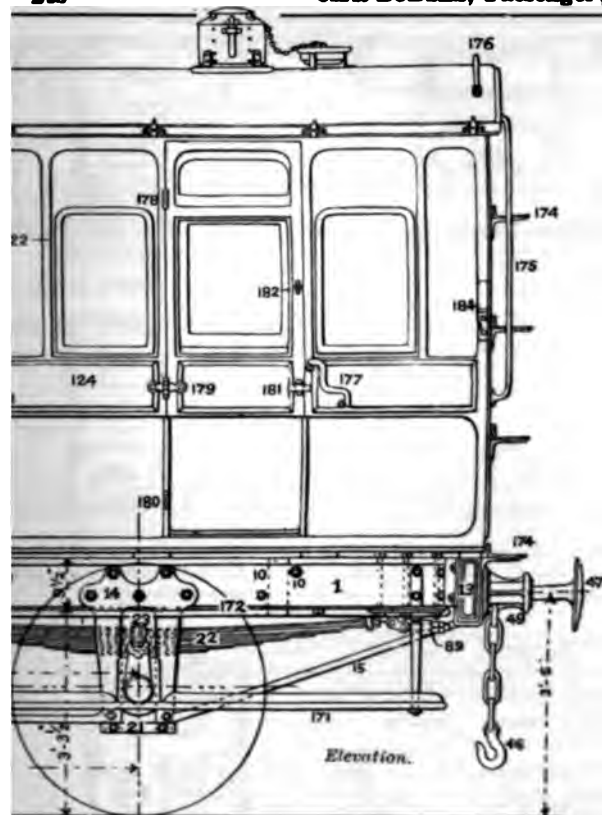


Fig. 207. End Elevation.
ENGLISH FIRST-CLASS CARRIAGE, CALEDONIAN RAILWAY.

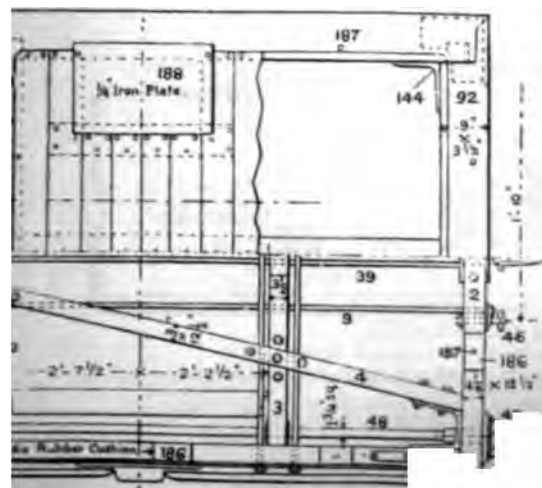
LIST OF NAMES OF PARTS:
Figs. 204-7.

- (Continued from previous page.)
 188. Splasher, Wheel-cover, or Wheel-plate.
 190. Curtain-rod.
 191. Curtain-rod Bracket.
 192. Parcel-net Rod.
 193. Parcel-net Bracket.
 194. Parcel-net.
 195. Glass-string Roller.
 196. Seat Cushion (reversible).
 197. Back Squab.
 198. Folding Arm-rest, or Elbow-rest.
 199. Head-rest.
 200. Arm Sling, Arm Hold-er, or Arm Strap.

203. Seat Sofa-spring.
 204. Glass-string, or Glass-strap.
 205. Seaming Lace.
 206. Broad Lace.
 207. Curled Horsehair.
 208. Door Sill-plate.

GENERAL CLASSIFICATION.

- No. 1-21 and 88-90. Underframe.
 No. 22-28 and 84-87. Running Gear.
 No. 29-52 and 145, 146. Draw and Buffing Gear.
 No. 91-144 and 150-152. Body.
 No. 154-207. Trimming.
 No. 177-182, 183-186 and 209. Furniture.



CAR-BODIES, Passenger; Sleeping Cars, etc.

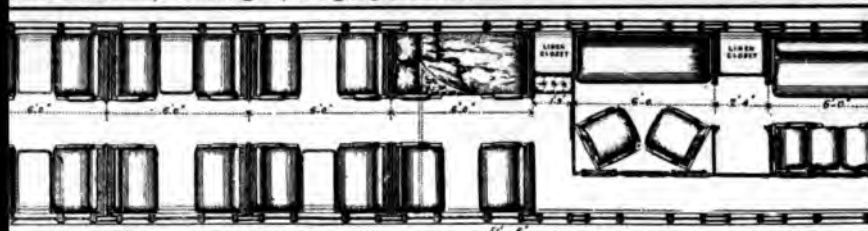


Fig. 208. PULLMAN PALACE SLEEPING CAR.

with smoking compartment at one end and a smaller state-room at the other, and with 10, sometimes 12, s

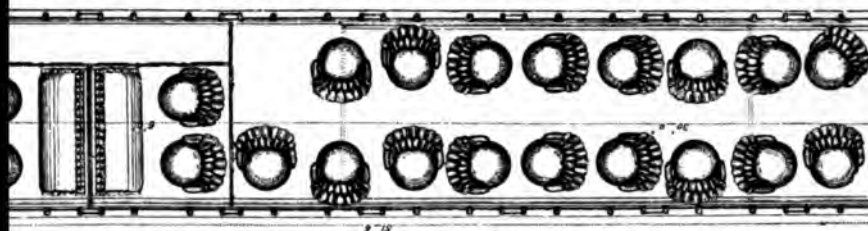


Fig. 209. PULLMAN PALACE DRAWING-ROOM CAR OR PARLOR CAR.

now almost invariably provided, as in the plan below. In many cases the smoking compartment is th
oss the car, the lavatory, closets and heater being interposed between the smoking room and the main

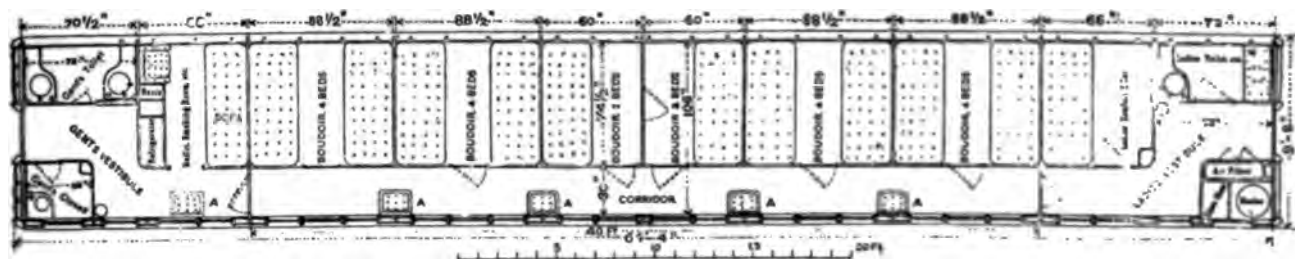


Fig. 212.

MAIN "BOUDOIR" SLEEPING CAR.

(For details of arrangements of boudoirs and berths see Figs. 690-691.)

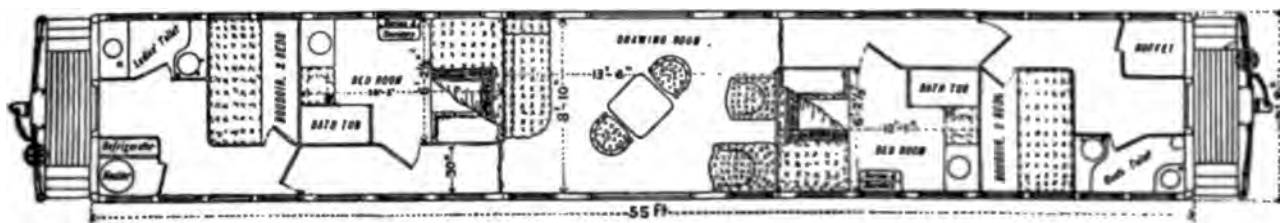


Fig. 213.

MAIN PRIVATE CAR, "ADELINA PATTI."

(An external view of this car, giving also the general appearance of Fig. 212 above, is shown in Fig. 50.)

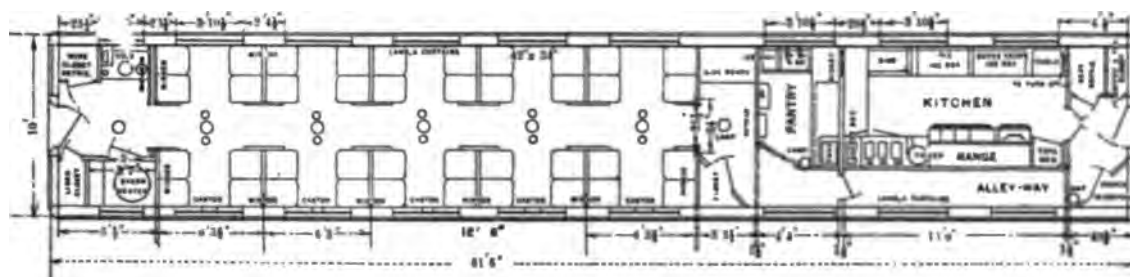


Fig. 214.

DINING CAR, CHICAGO, MILWAUKEE & ST. PAUL RAILROAD, with 10 SECTIONS OR TABLES.

(Another style of Dining Car is shown with more detail in Figs. 191-194. The part marked ALLEY-WAY herein is more properly a CORRIDOR.)

BOLSTERS, ETC.

NAMES OF PARTS OF BOLSTERS, ETC.; *Figs. 215 to 225.*

bolster.	4. Body-bolster Truss-	7. Body-bolster Truss-	11.
bolster Compres-	block.	rod Washer.	12.
-bar.	5. Body-bolster Truss-	8. Body Centre-plate.	13.
bolster Tension-	rod Bearing.	9. King-bolt or Centre-pin.	14.
bolster Thimble.	6. Body-bolster Truss-	10. King-bolt Plate or	15.
	rod.	Centre-pin Plate.	

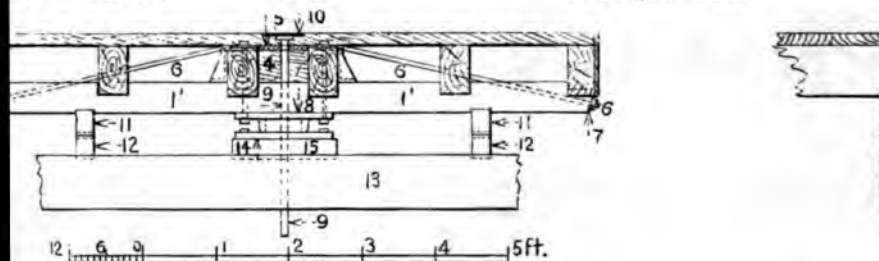


Fig. 215.
WOODEN BODY-BOLSTER.
Transverse Section of Floor timbers, showing Bolsters.

W. WOOD

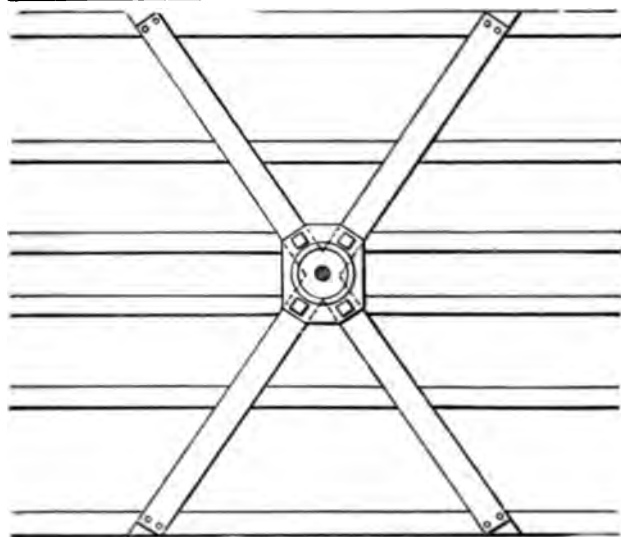


Fig. 221. Inverted Plan.
SNOW BODY-BOLSTER.



Fig. 222.
SNOW BODY-BOLSTER.
Side View.

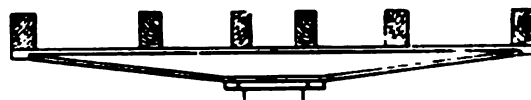


Fig. 223.
SNOW BODY-BOLSTER.
End View

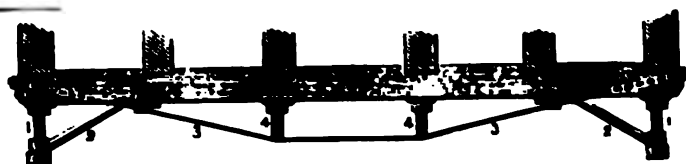


Fig. 224.
CROSS-FRAME TRUSS OR NEEDLE-BEAM TRUSS.

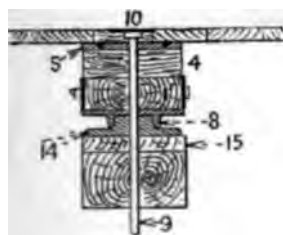


Fig. 225.
COMPOUND BODY-BOLSTER
(Cross Section)

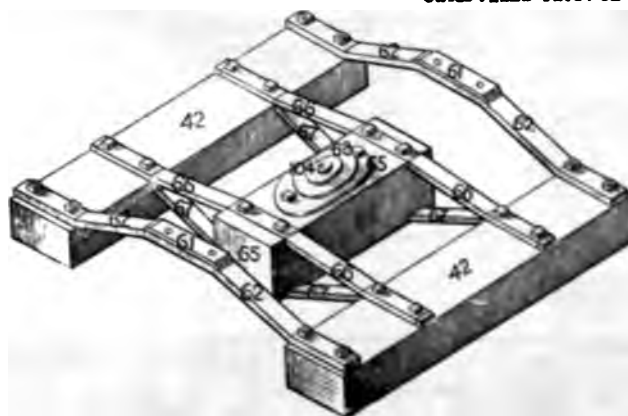


Fig. 226. Perspective View.
TRUCK BOLSTER FOR SIX-WHEELED TRUCK.
(See also TRUCKS and TRUCK DETAILS.)

NAMES OF PARTS; Fig. 224.

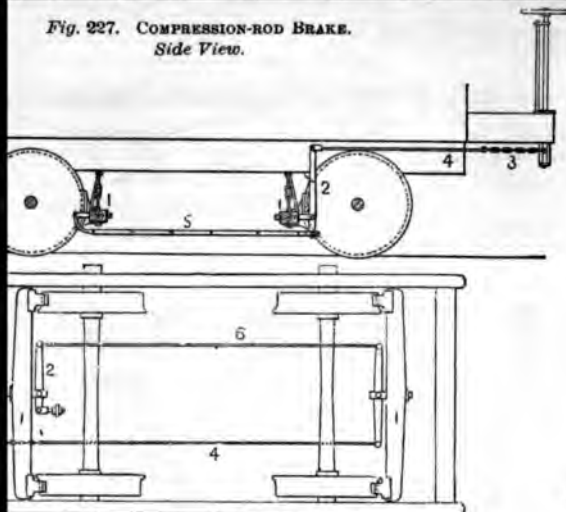
1. Body Queen-post.
2. Body Queen-post Stay.
3. Cross-frame Truss-rib, or Needle-beam Truss-rib.
4. Cross-frame Queen-post, or Needle-beam Queen-post.
5. Cross-frame Tie-timber, or Needle beam.

NAMES OF PARTS; Fig. 226.

42. Spring-beam.
61. Truck Side-bearing.
62. Side-bearing Bridge.
63. Truck Centre-plate.
65. Centre-bearing Beam.
66. Centre-bearing Arch-bar.
67. Centre-bearing Inverted Arch-bar.
104. King-bolt, or Centre-pin.

CAR-BODY DETAILS; Brake Gear.

Fig. 227. COMPRESSION-ROD BRAKE.
Side View.



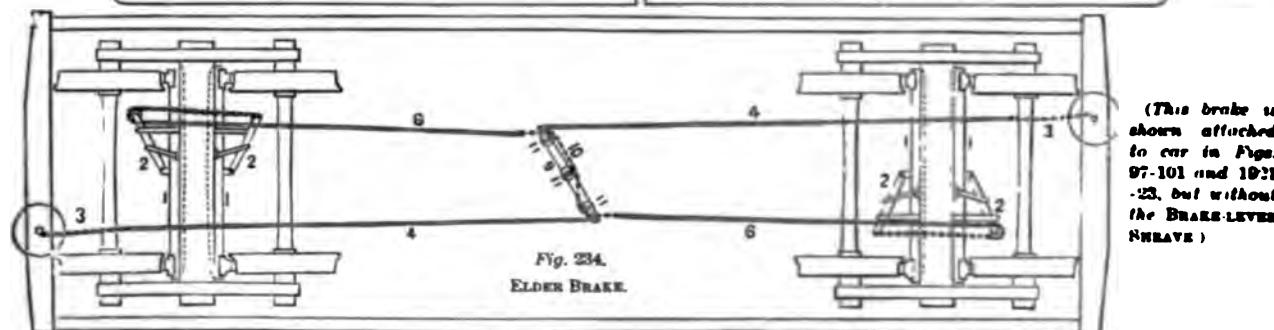
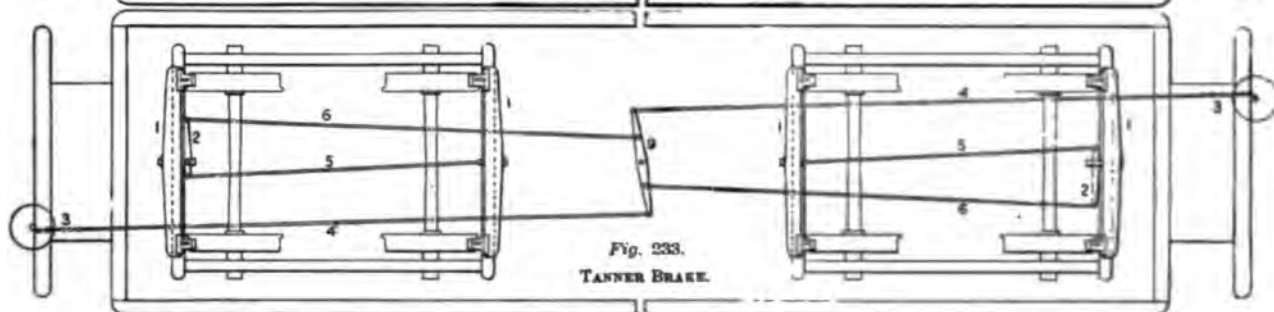
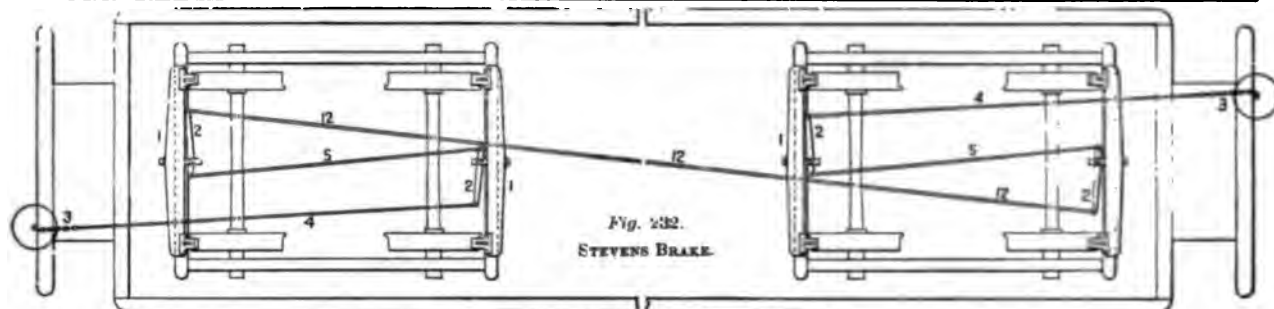
LIST OF NAMES OF PARTS Figs. 227-228

1. Brake-beam.
2. Brake-lever. (Often distinguished as Dead-lever. See Figs. 338-339)
3. Brake-shaft Chain
4. Brake-shaft Connection
5. Lower Brake-rod.
6. Secondary Brake-rod
7. Floating-lever.
8. Floating Connection
9. Centre Brake-lever
10. Centre Brake-lever
11. Centre Brake-lever
12. Long Brake-rod.

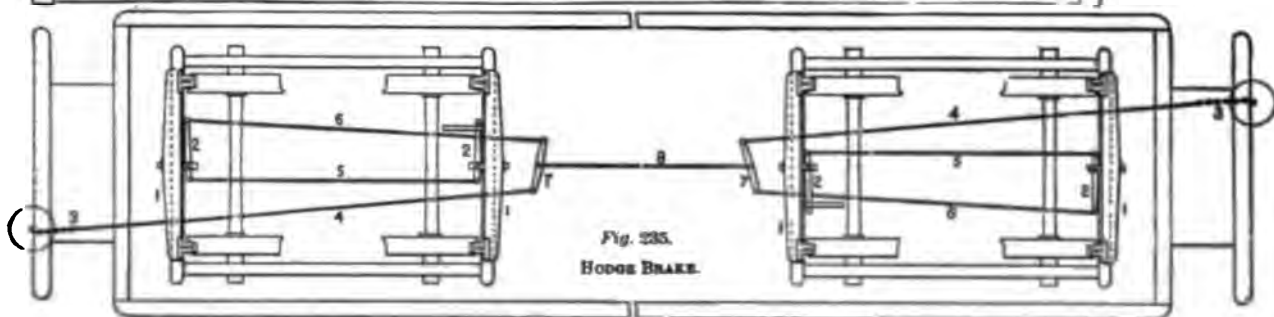
(Another style of Brake-gear, different from the following, is shown in Fig. 228.)

Fig. 228. BRAKE FOR DROP-BOTTOM CAR. Plan.





(This brake is shown attached to car in Figs. 97-101 and 102-123, but without the BRAKE-LEVER MECHANISM.)

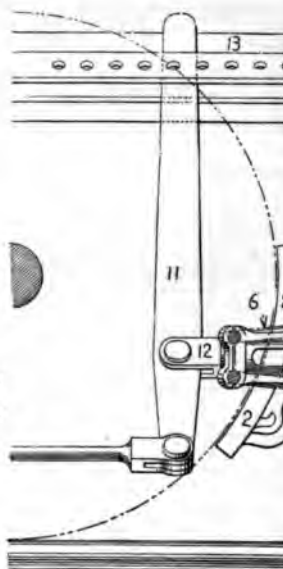


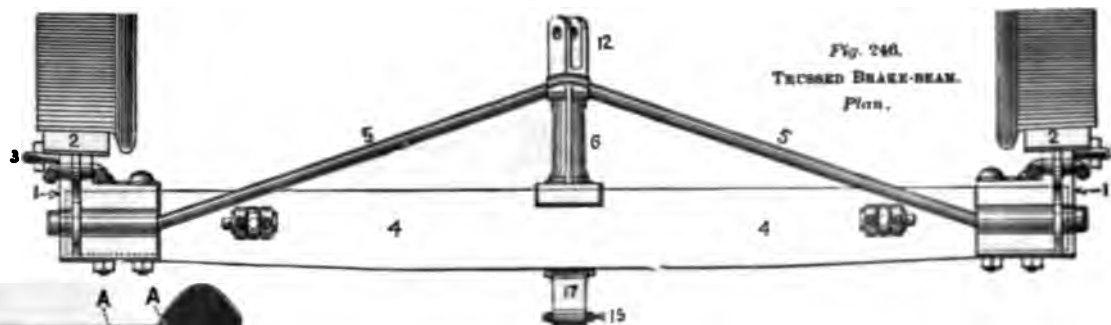
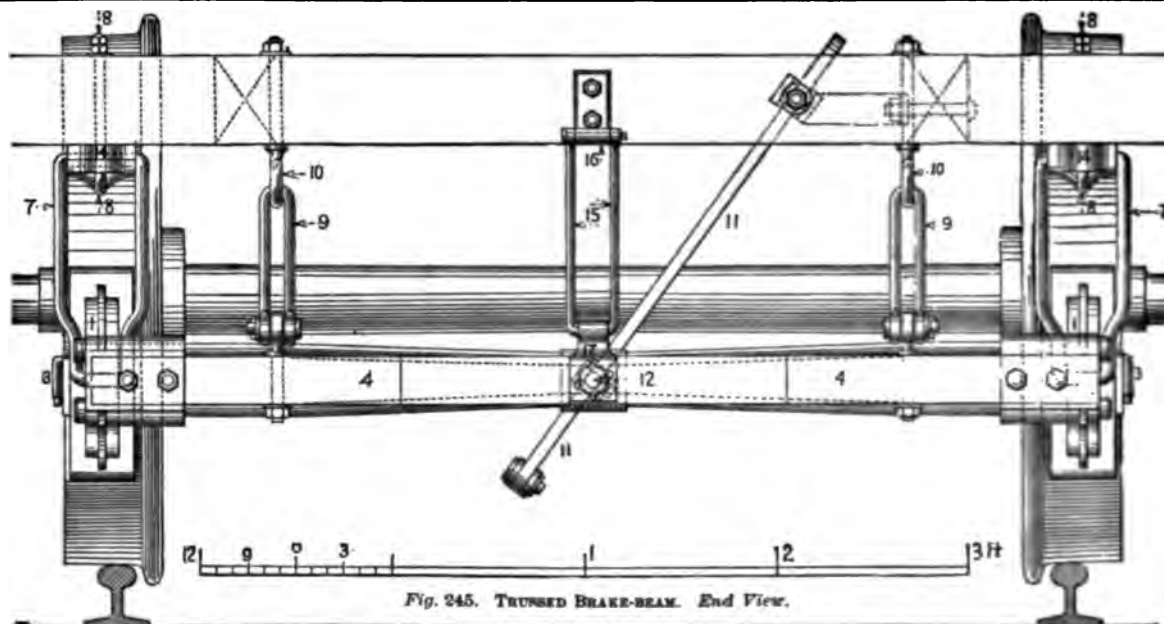
44. CAR-BODY DETAILS ; Brake-gear.

OF PARTS OF BRAKES, FIGS. 236-246 (See also Figs. 249-251.)

- | | |
|-----------------------|------------------------------------|
| ock. | 10. Brake Safety-chain Eye-bolt. |
| pe. | 11. Brake-lever (see Note). |
| oe Key. | 12. Brake-lever Fulcrum. |
| Brake-beam. | 13. Brake-lever Stop. |
| am Truss-rod. | 14. Brake-hanger Bearing. |
| am King-post. | 15. Parallel Brake-hanger. |
| nger. | 16. Parallel Brake-hanger Carrier. |
| nger Carrier. | 17. Parallel Brake-hanger Eye. |
| safety-chain or Link. | |

(The two brake-levers, 11, of a truck are often further distinguished as *Dead Lever* and *Live Lever*, as shown in Figs. 338-348.)





NAMES OF PARTS, Figs. 247-8.

- A. Flange Bearing-block.
- B. Outside Flange-lip.
- C. Inside Flange-lip.
- D. Tread Bearing-block.
- E. Tire.



ROSS FLANGE BRAKE-BEAM.

1. CAR-BODY DETAILS; Brake-gear.

TS; Figs. 249-251.

e-beam.
Truss-rod.
King-post.

Carrier.

See note to Fig. 236).

ulcrum.

top.

Bearing.

uide.

Brake-lever Coupling-bar.

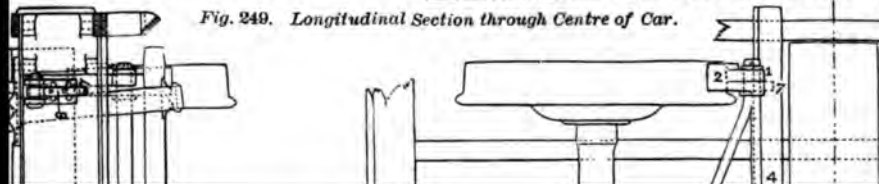
Coupling-bar Pin.

Brake-shaft Connecting Rod.

PROPOSED STANDARD DRAW-
GEAR FOR FREIGHT
SERVICE.

Designed by Geo. Westing-
house, Jr.

Fig. 249. Longitudinal Section through Centre of Car.



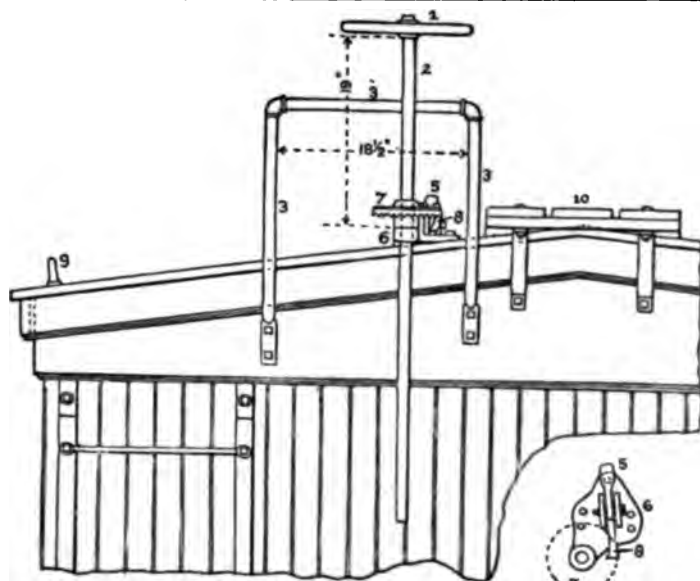


Fig. 252. End Elevation.

Fig. 253. Plan.

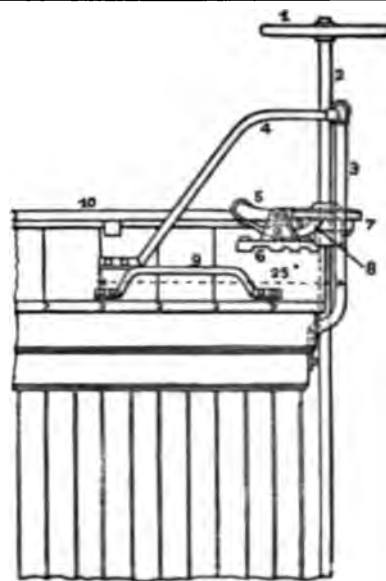


Fig. 254. Side Elevation.

Brake-gear of New York Central and Hudson River Railroad and connecting lines, and New York, West Shore & Buffalo Railway (Shown attached to cars in Figs. 93-96 and 97-101; shown enlarged on the following page.)

NAMES OF PARTS; Figs. 252-254.

- | | |
|---------------------|-------------------------------------|
| 1. Brake-wheel. | 6. Brake-pawl Carrier. |
| 2. Brake-shaft. | 7. Brake Ratchet. |
| 3. Roof Hand-rail. | 8. Brake Pawl. |
| 4. Hand-rail Brace. | 9. Roof Grab-iron or Ladder-handle. |
| 5. Brake-pawl Dog. | 10. Running-board. |

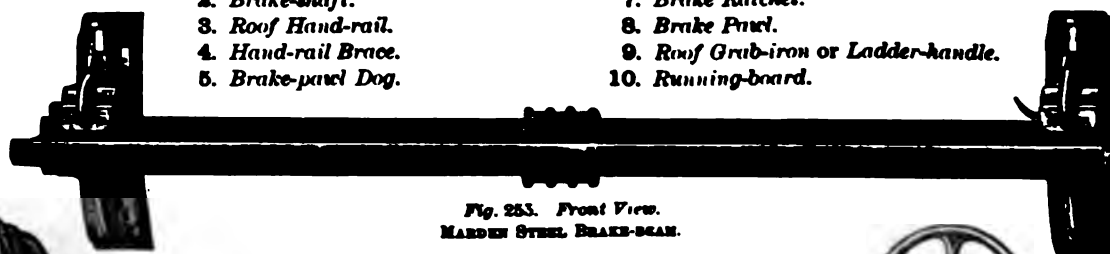


Fig. 255. Front View.
HARDEN STEEL BRAKE-BEAM.



Fig. 256. End View.



Fig. 257. BRAKE-WHEEL.
(Sometimes on coal cars and elsewhere a more
brutal rod, as shown in Fig. 108.)

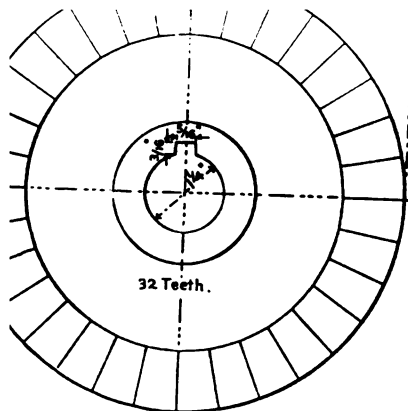


Fig. 258.
TORST-WHEEL.

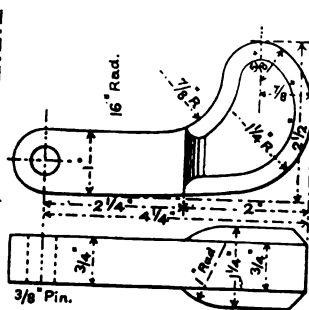


Fig. 259.
BRAKE-PAWL Dog.



Fig. 261.
Plan.

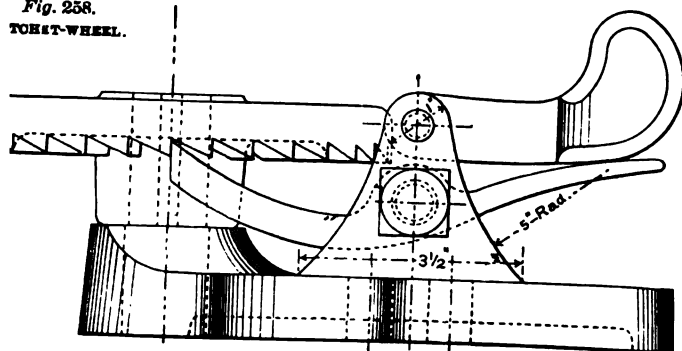
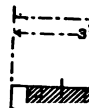


Fig. 260. Elevation.
BRAKE RATCHET GEAR, COMPLETE.



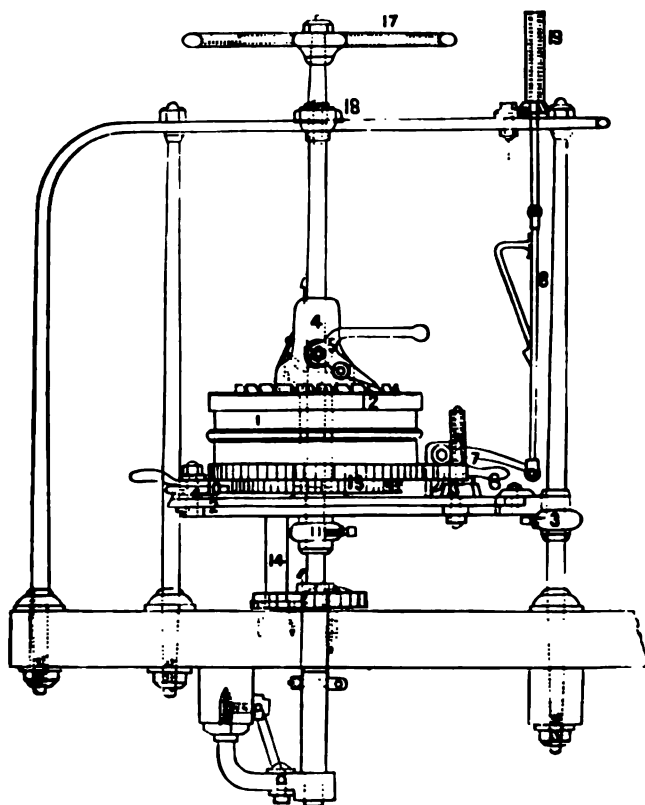


Fig. 263. End View.
CREAMER BRAKE (Obsolete).

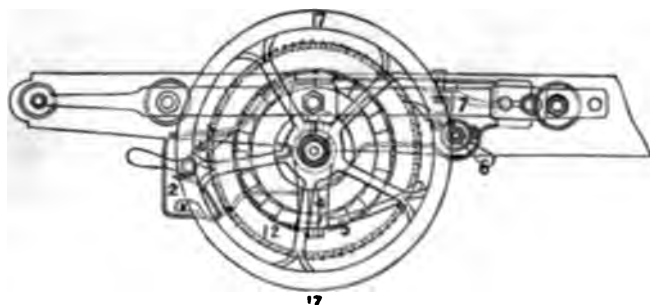


Fig. 264. CREAMER BRAKE Plan.

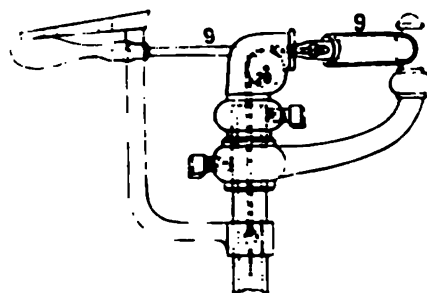
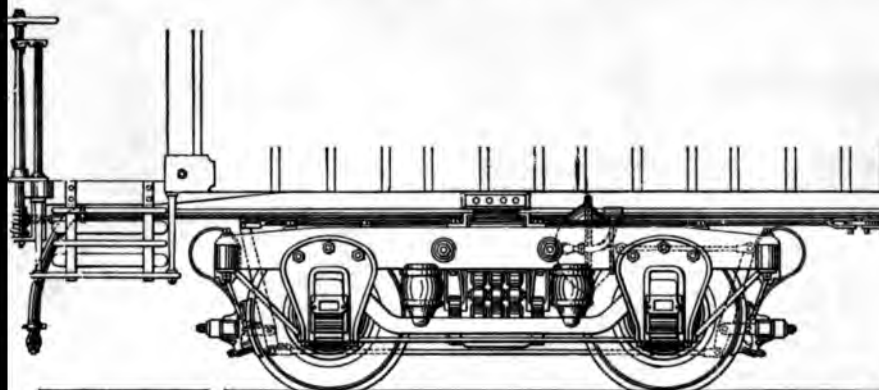


Fig. 265. Side View.
ROOF-LEVER, FOR CREAMER BRAKE

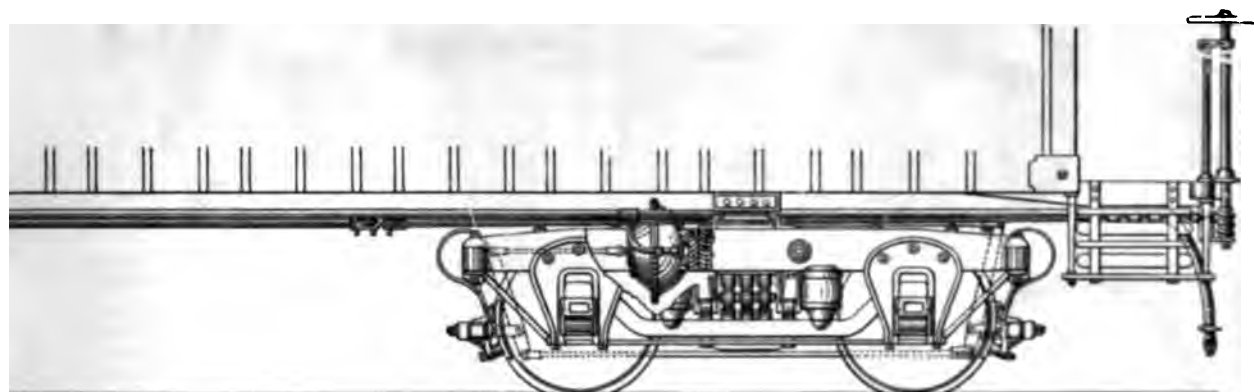
NAMES OF PARTS, Figs. 263-265.

- | | | | |
|-----------------------|--------------------|----------------------------------|--------------------------------|
| 1. Drum. | 7. Tripping-lever. | 13. Stud, for Jointed Side-pawl. | 16. Pipe-stay. |
| 2. Cross-bar. | 8. Connecting-rod. | 14. Standard, for Cross-bar. | 17. Brake-wheel. |
| 3. Post-bracket. | 9. Roof-lever. | 15. Bottom - ratchet of Drum. | 18. Upper Brake-shaft Bearing. |
| 4. Top-arm. | 10. Side-pawl. | | 19. Guard-pipe. |
| 5. Jointed Top-pawl. | 11. Collar. | | 20. Chain-pulley. |
| 6. Jointed Side-pawl. | 12. Drum-corer. | | |

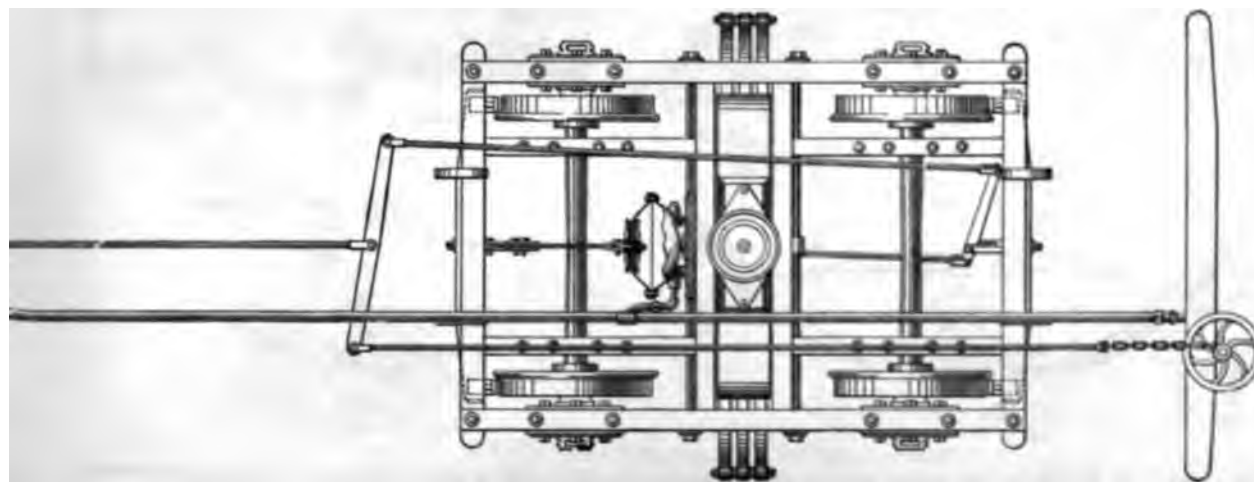
266-267. CAR-BODY DETAILS, Brake-gear, Air; *Eames Vacuum.*



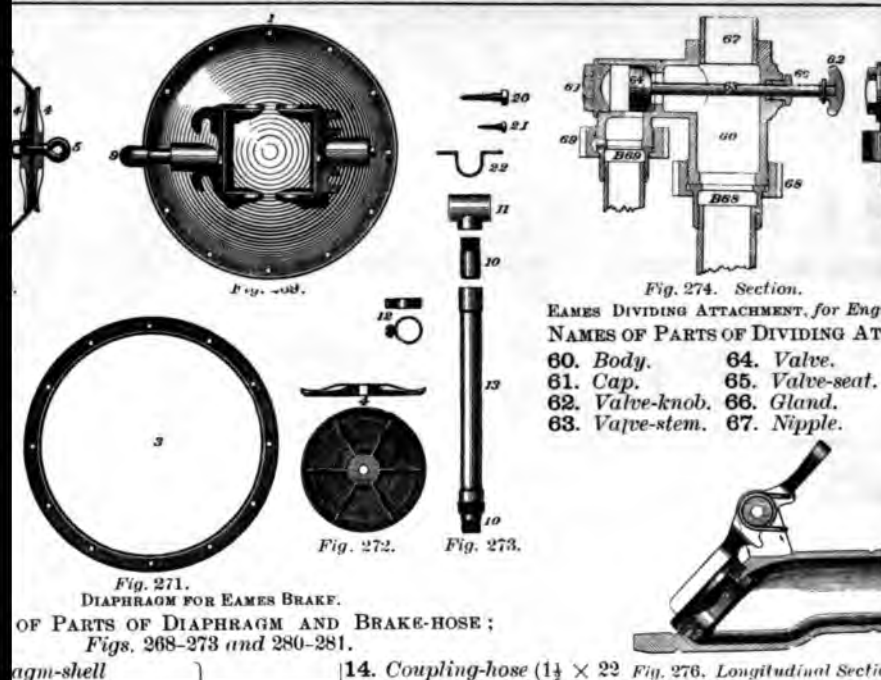
121.5
EAMES



9 10 11 12 13 14 15 ft.



281. CAR-BODY DETAILS, Brake-gear, Air; Eames Vacuum.



NAMES OF PARTS OF EJECTOR : Figs. 282-288.

- A1. Steam-body.
- D2. Air-body.
- 3. Upper Body.
- C4. Release-valve Body
- 5. Main Air-tube.
- 6. Upper Air-tube.

- A7. Air Check-valve Seat.
- B7. Air Check-valve.
- 8. Release-valve.
- A8. Release-valve Seat.
- 10. Steam Spinner-nut.
- 12. Union-nut.

- 13. Release-lever Fulcrum.
- B16. Ball Drip-valve Body.
- 17. Release-valve Stud.
- 18. Release-valve Nut.
- 20. Fulcrum pin.
- 22. Handle Nut.

- 23. Handle Ferrule.
- 24. Handle.
- 25. Release-lever.
- B28. Steam-valve Body.
- A29. Steam-valve Nut.
- A30. Lever-quadrant.
- 36. Top Tube.
- 41. Steam-valve Lever.
- 42. Lever quadrant Stud.
- 43. Lever-quadrant Nut.
- 44. Valve stem Nut.
- A47. Base-cap Screw.
- 48. Steam-valve Gland.
- B49. Steam-valve.
- C49. Steam-valve Seat.
- 50. Ball Joint (for 1 in. Steam-pipe).
- B51. Steam-valve Stem.
- 53. Exhaust-pipe.
- 54. Nipple.
- B55. Union-part.
- 56. Drip-valve Body.
- 57. Drip-valve Cup.
- 58. Drip-valve.
- 59. Drip-valve Ball.

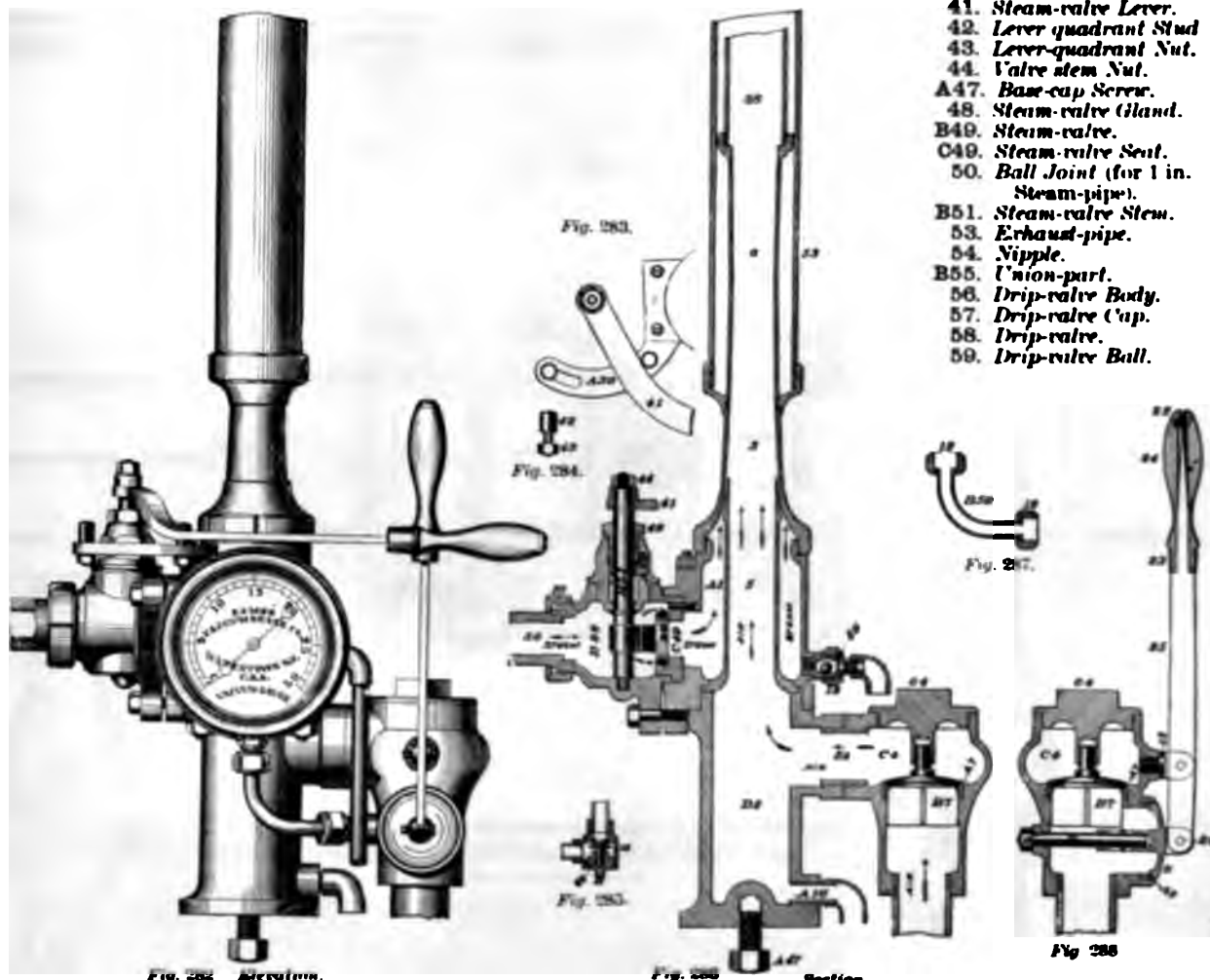


Fig. 282. Ejector.

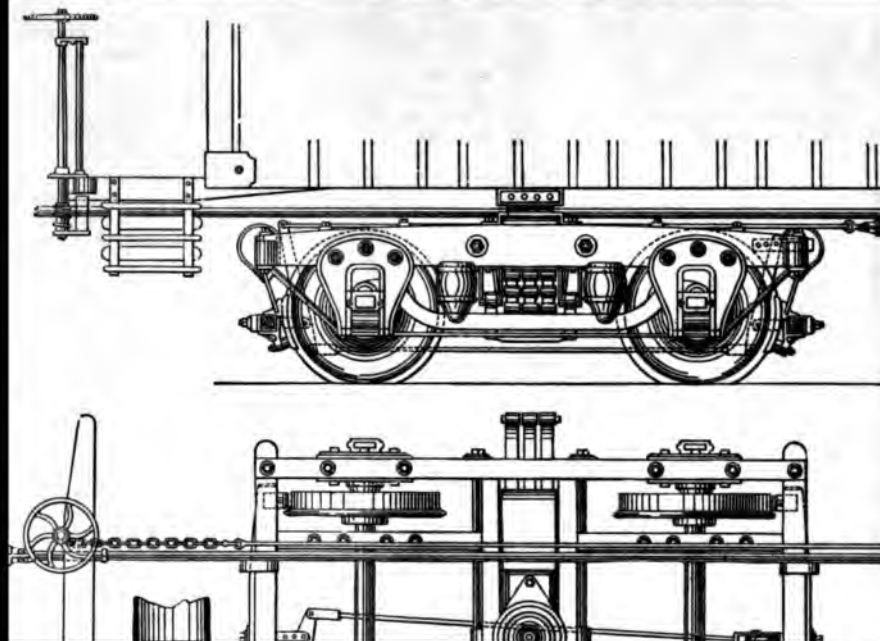
Fig. 283. Section.

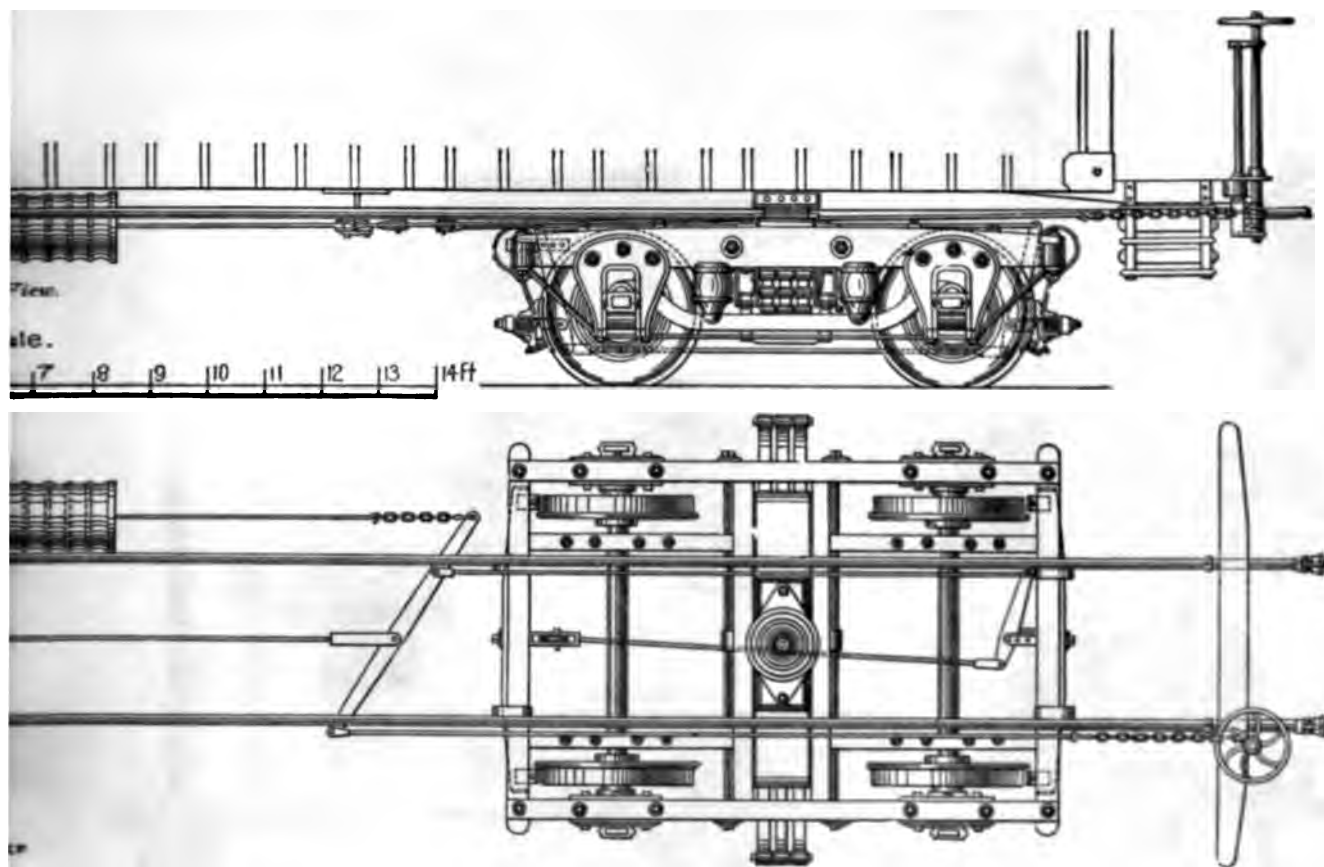
Fig. 288

EAMES EJECTOR.

(The reference numbers are the same as used in the makers' lists.)

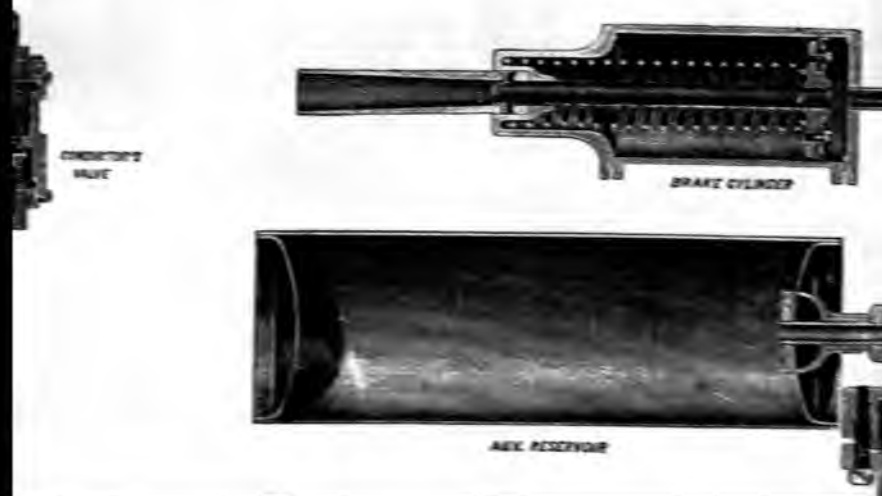
8. 289-292. CAR-BODY DETAILS, Brake-gear, Air; *Smith Vacuum.*





NOTE.—The Smith Vacuum-brake is in use on but one road in this country, the Lono Island Railroad but is in extended use in England in a somewhat modified form.

CAR-BODY DETAILS, Brake Gear, Air; *Westinghouse.*



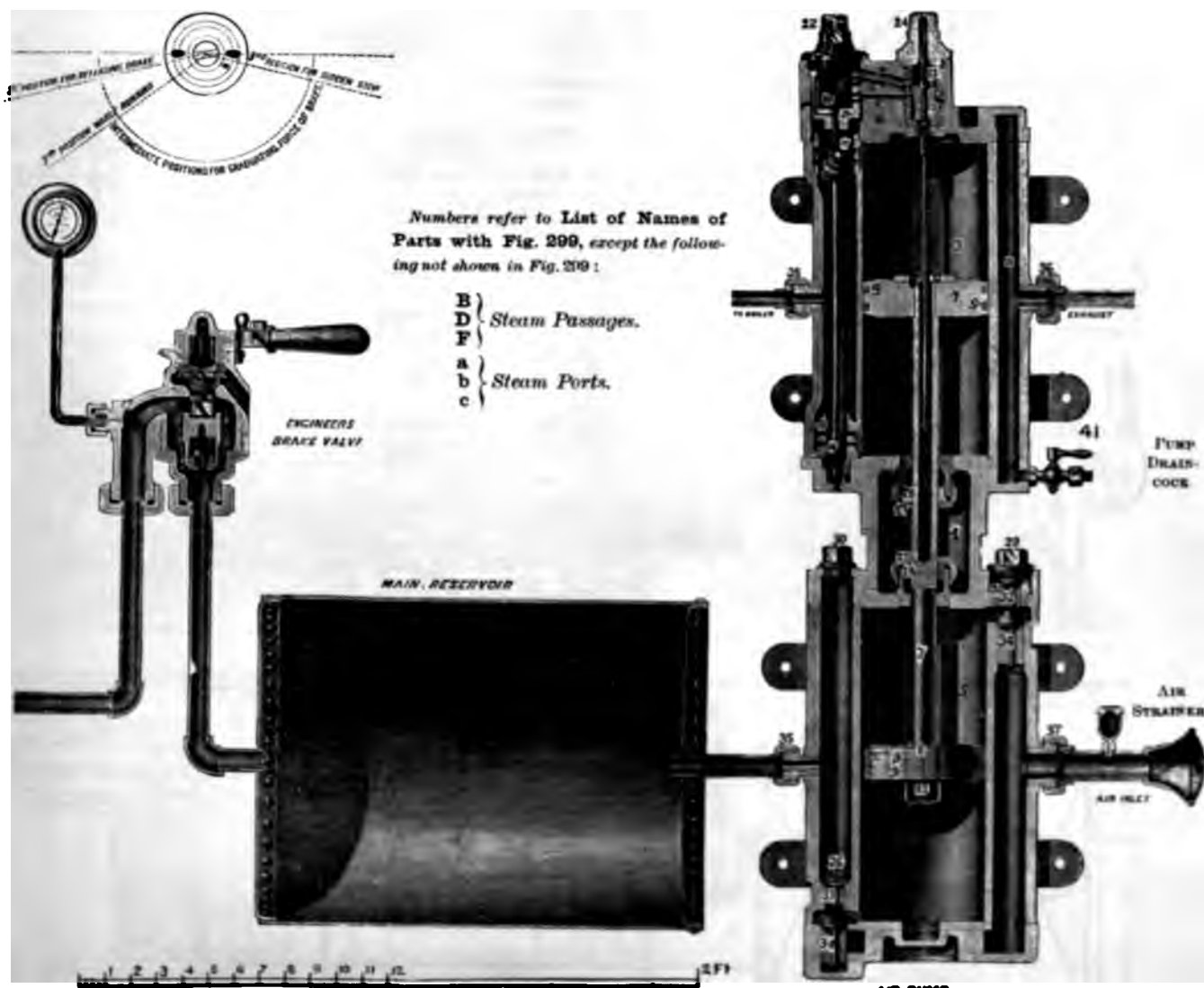


Fig. 204.

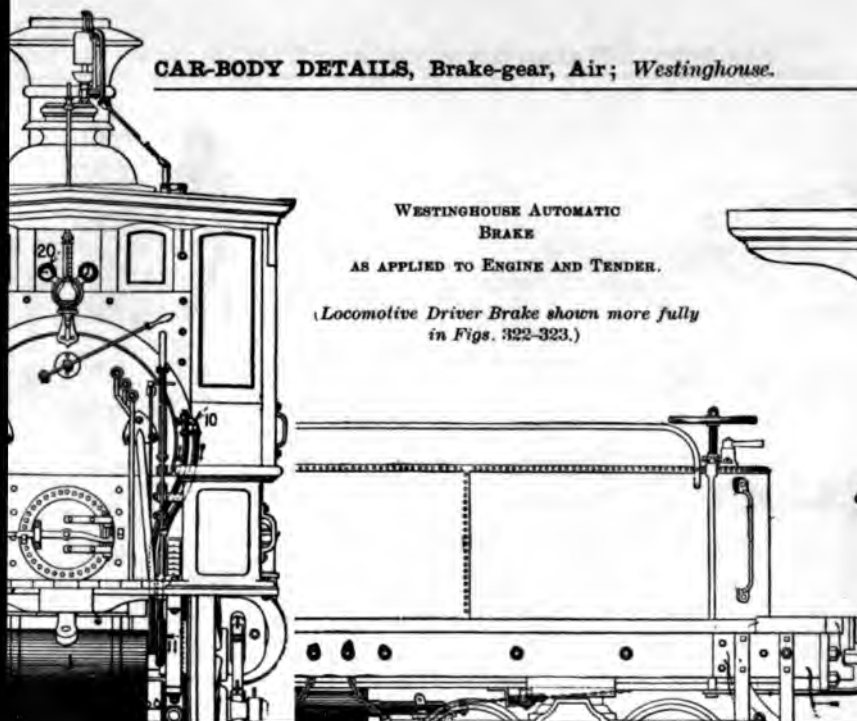
SHOWING THE RELATION OF THE VARIOUS PARTS TO EACH OTHER

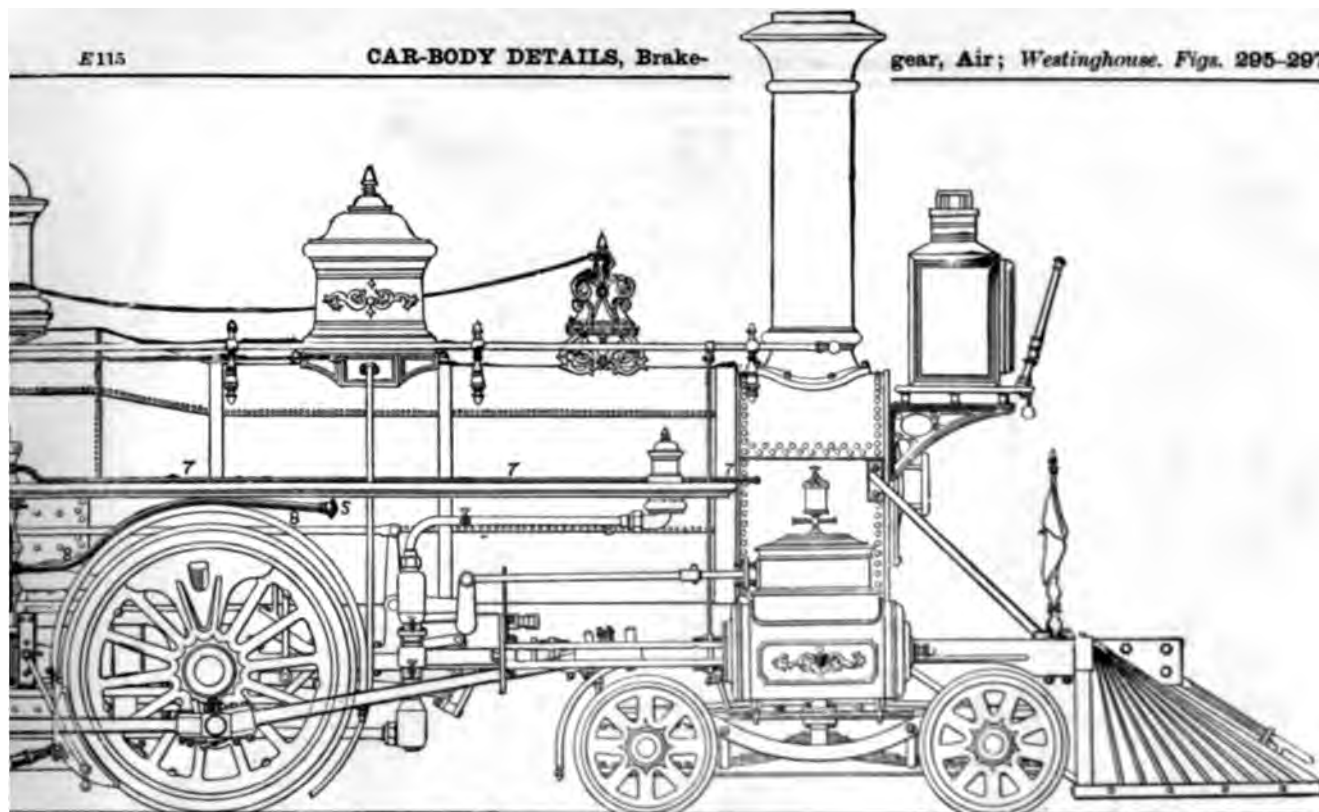
CAR-BODY DETAILS, Brake-gear, Air; Westinghouse.

WESTINGHOUSE AUTOMATIC
BRAKE

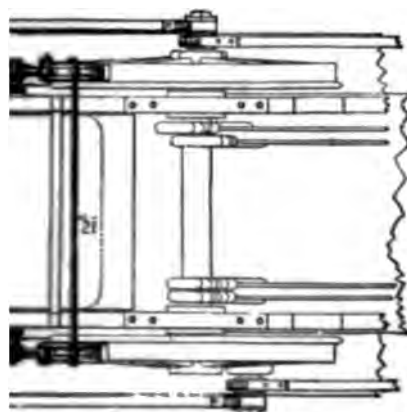
AS APPLIED TO ENGINE AND TENDER.

(Locomotive Driver Brake shown more fully
in Figs. 322-323.)



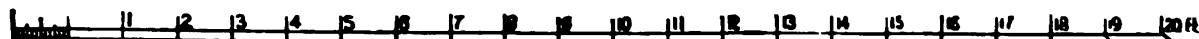


**NAMES OF PARTS OF WESTINGHOUSE-BRAKE ATTACHED TO LOCOMOTIVE AND TENDER:
Figs. 295-297.**



- | | |
|---------------------------------------|-----------------------------------|
| 1. Main Reservoir. | 12. Driving-wheel Brake cylinder. |
| 2. Brake-cylinder, for Tender-brake. | 13. Throttle-valve. |
| 3, 4. Engine and Air-pump. | 14. Brake-pipe. |
| 3. Steam-cylinder. | 15. Stop-cock. |
| 4. Air-cylinder. | 16. Triple-valve. |
| 5. Air-strainer. | 17. Triple-valve Branch-pipe. |
| 6. Steam-pipe. | 18. Auxiliary-reservoir. |
| 7. Exhaust-pipe. | 19. Brake-cylinder Pipe. |
| 8. Supply-pipe, or Air-inlet. | 20. Air-gauge. |
| 9. Discharge-pipe, or Reservoir-pipe. | 21. Brake-block Tie-rod. |
| 10. Three-way Cock. | 22. Driver-brake Pipe. |
| 11. Tender Brake hose. | 23. Driver-brake Hose. |

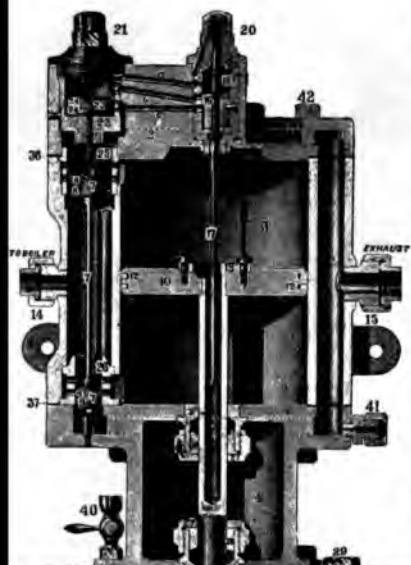
NOTE. - In Fig. 297 the driver-brake is shown operated from the triple-valve on the tender, which is the arrangement in general use. The latest and most approved design, however, is to operate the driver-brake from a triple-valve and separate reservoir placed on the engine.



WESTINGHOUSE AIR-PUMPS AND ENGINE
COMPLETE.

NAMES OF PARTS ; Fig. 298 (and 299).

(Figures in parentheses refer to Fig. 299.)



2. Steam-cylinder Head (carrying Reversing-cylinder, Reversing-piston and Reversing-valve Bushes). (2)
3. Steam-cylinder (carrying Main Valve and Bushes). (3)
4. Centre-piece. (4)
5. Air-cylinder (carrying Lower Discharge-valve). (5)
6. Air-cylinder Head. (6)
7. Main-valve (upper and lower). (14)
8. Upper Main-valve Packing-ring. (15)
9. Lower Main-valve Packing-ring. (16)
10. Steam-piston and Piston-rod. (7)
11. Air-piston. (8)
12. Steam-piston Packing-ring. (9)

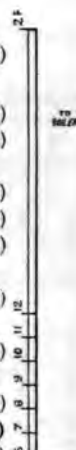




Fig. 300.
(1.) MAIN RESERVOIR.



Fig. 301.
(2.) AUXILIARY RESERVOIR (12 by 33 in.).



Fig. 302.
(3.) AUXILIARY RESERVOIR (10 by 24 in.).



Fig. 303.
(7.) NARROW-GAUGE CAR-CYLINDER.
(See Fig. 331.)



Fig. 304.
(4.) STANDARD (6 in.) AIR-PUMP.
(See Fig. 300.)



Fig. 305.
(5.) EIGHT-INCH AIR-PUMP.
(See Fig. 300.)



Fig. 306.
(6.) NARROW-GAUGE AIR-PUMP.



Fig. 308.
(10.) STANDARD DRIVING-WHEEL
BRAKE-CYLINDER.
(See Fig. 314.)

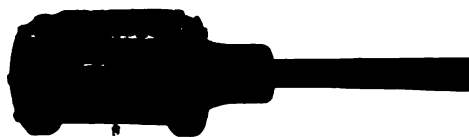


Fig. 307.
(8.) TENDER CYLINDER.
(See Fig. 330.)



Fig. 309.
(9.) STANDARD CAR-CYLINDER.
(See Fig. 328.)



Fig. 310.
(11.) NARROW-GAUGE DRIVING
WHEEL BRAKE-CYLINDER.

These parts are shown in service in Figs. 293-297 and 294-298.
(The reference numbers in parentheses are those used in the makers' lists.)

BODY DETAILS, Brake-gear, Air; Westinghouse.



NAMES OF PARTS ; Fig. 312.

2. Regulator-body.
3. Lower Head.
4. Lower Cap.
5. Lower Valve.
6. Diaphragm.
7. Regulating-spring.
8. Regulating-nut.
9. Piston.
10. Piston Packing-ring.
11. Piston-spring.
12. Steam-valve.
13. Upper Spring.
14. Upper Cap.
15. Valve rod.
16. Union-nut.

(See note to Fig. 322.)

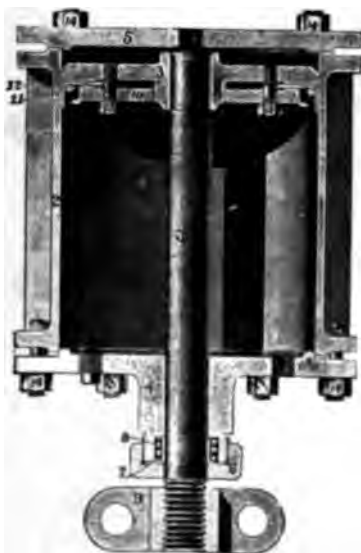


Fig. 314. STANDARD (EIGHT-INCH) BRAKE-CYLINDER,
for DRIVING-WHEEL BRAKE.
(External view, Fig. 316.)

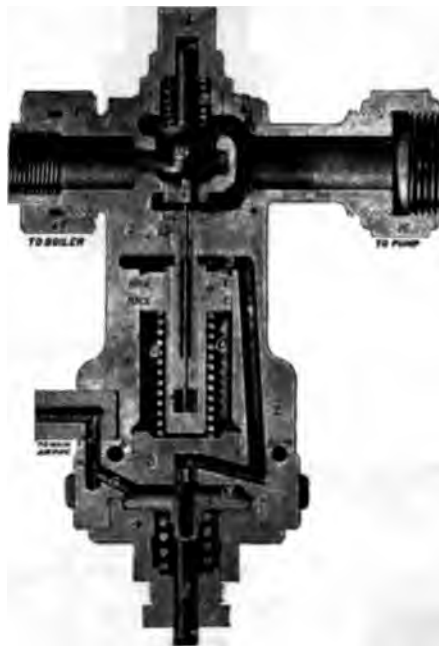


Fig. 312. PUMP REGULATOR.
(Old style ; see Fig. 316 for improved form.)
(External view ; 17, Fig. 311.)

NAMES OF PARTS OF BRAKE-CYLINDERS ;
Figs. 314-15.

2. Cylinder-body.
3. Piston and Piston-rod.
4. Lower, or Bottom Cylinder-head.
5. Upper, or Top Cylinder-head.
6. Piston-rod Packing-nut.
7. Piston-rod Cup-leather.
8. Piston-rod Packing-spring.
9. Cross-head.
10. Piston Follower.
11. Piston Packing-leather.
12. Piston Packing-expander.
13. Piston Follower-bolt.
14. Cylinder Bolts.

(See note to Fig. 322.)

(The reference numbers are the same as used in the makers' lists.)



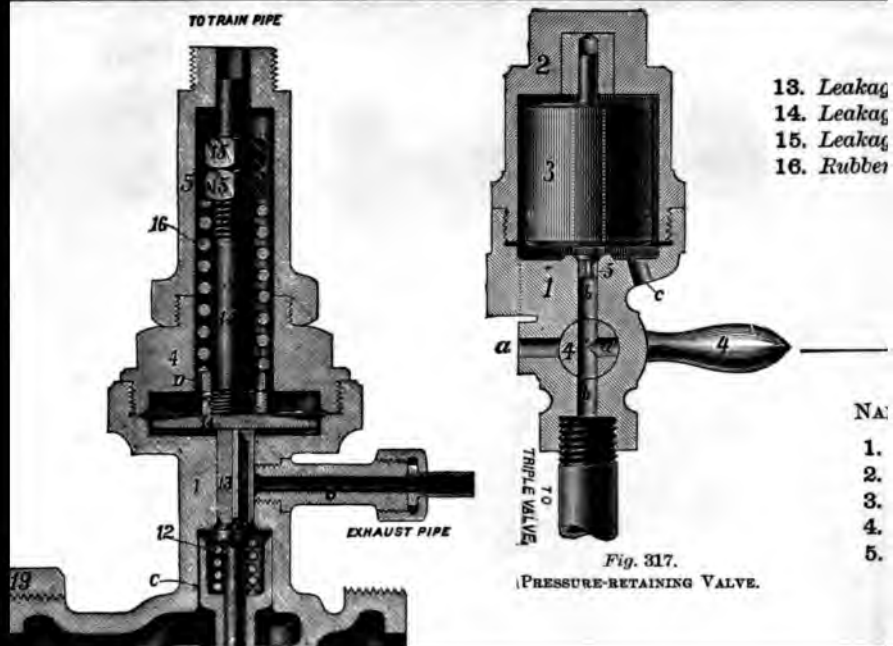
Fig. 313. Section.
DOUBLE-CHECK VALVE (little used).
External view ; 29, Fig. 311.
(Designed to be used in connection with
the auxiliary brake-valve, Fig. 330, to con-
nect the second line of "straight air" pipes
with the brake-cylinders.)

NAMES OF PARTS ; Fig. 313.

1. Valve-case.
2. Valve-case Cap.
3. Piston.
4. Valve-face.
5. Piston Packing ring.
6. Slide valve.
7. Slide-valve Guide.



Fig. 315.
SIX-INCH BRAKE-CYLINDER, for DRIVING-
WHEEL BRAKE (Narrow Gauge).
(External view, Fig. 310.)



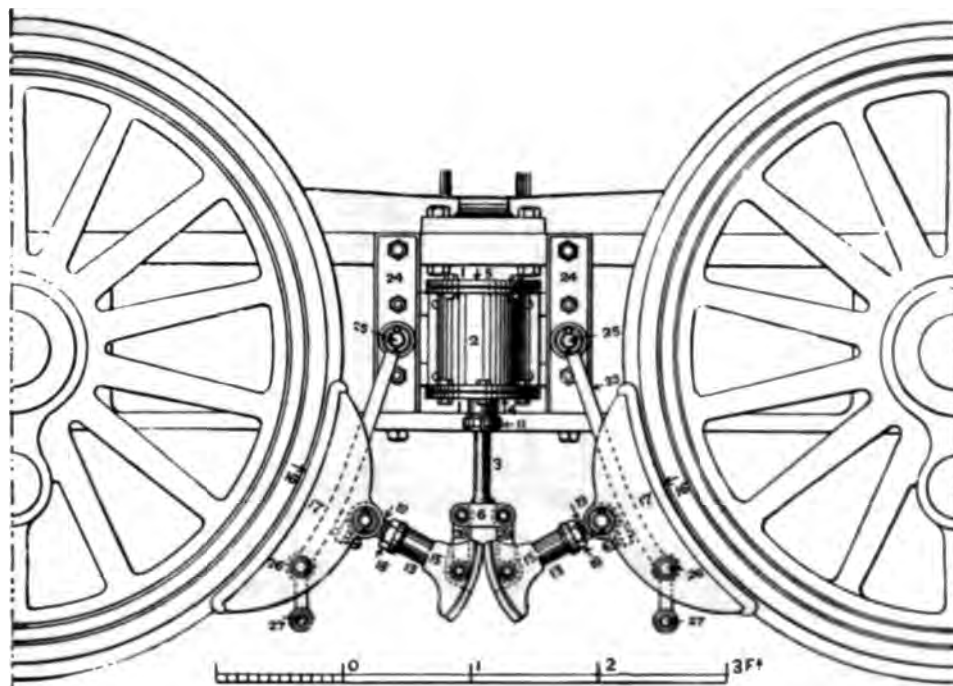


Fig. 322. Side View.



Fig. 323. End View.

WESTINGHOUSE DRIVING-WHEEL BRAKE

NAMES OF PARTS: Figs. 322-323.

- | | | | |
|--------------------------|----------------------------------|--------------------------------|-----------------------------------|
| 1. Cylinder. | 7. Piston-follower. | 13. Eccentric-lever, complete. | 24. Brake-block Suspending-plate. |
| 2. Cylinder-body. | 8. Piston Packing-leather. | 15. Eccentric-lever Casting. | 25. Brake-block Suspending-stud. |
| 3. Piston. | 9. Piston Packing-expand-er. | 16. Brake-shoe. | 26. Brake-block Pin. |
| 3'. Piston-head. | 10. Piston Follower-bolt. | 17. Brake-block. | 27. Brake-block Pin-rod. |
| 3". Piston-rod. | 11. Piston-rod Packing-nut. | 18. Eccentric-lever nut. | 28. Eccentric-lever Link. |
| 4. Bottom Cylinder-head. | 12. Piston-rod Packing-leath-er. | 19. Eccentric-lever Stud. | |
| 5. Top Cylinder-head. | | 20. Eccentric-lever Stud. | |
| 6. Cross-head. | | 21. Eccentric-lever Stud. | |

NOTE: Nearly all the above parts are also used elsewhere, and in naming them should be specified for perfect distinctness, when necessary, as for Driving-wheel Brake. This note also applies to most of the other parts of the Westinghouse Brake.

25. CAR-BODY DETAILS, Brake-gear, Air; *Westinghouse*.

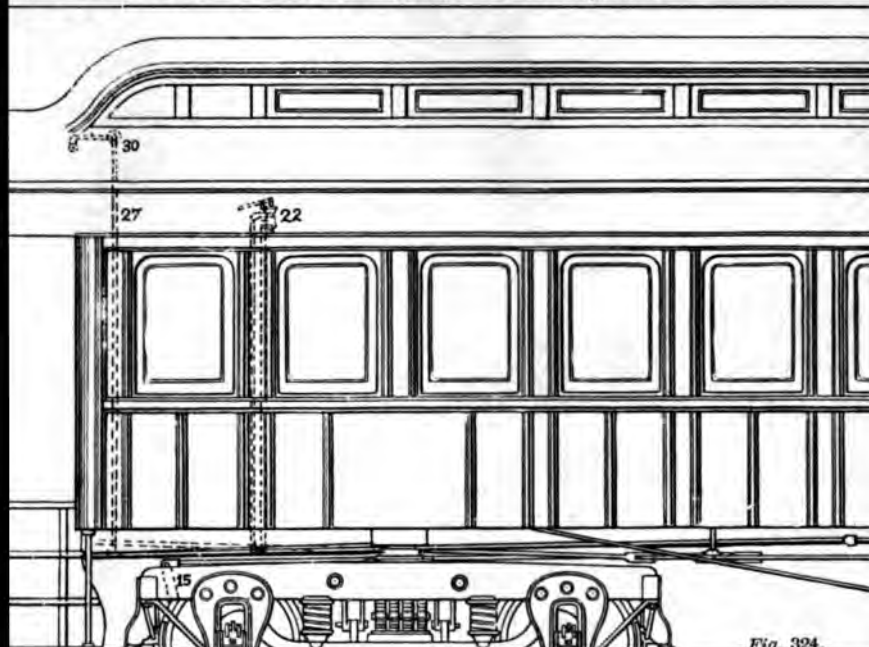
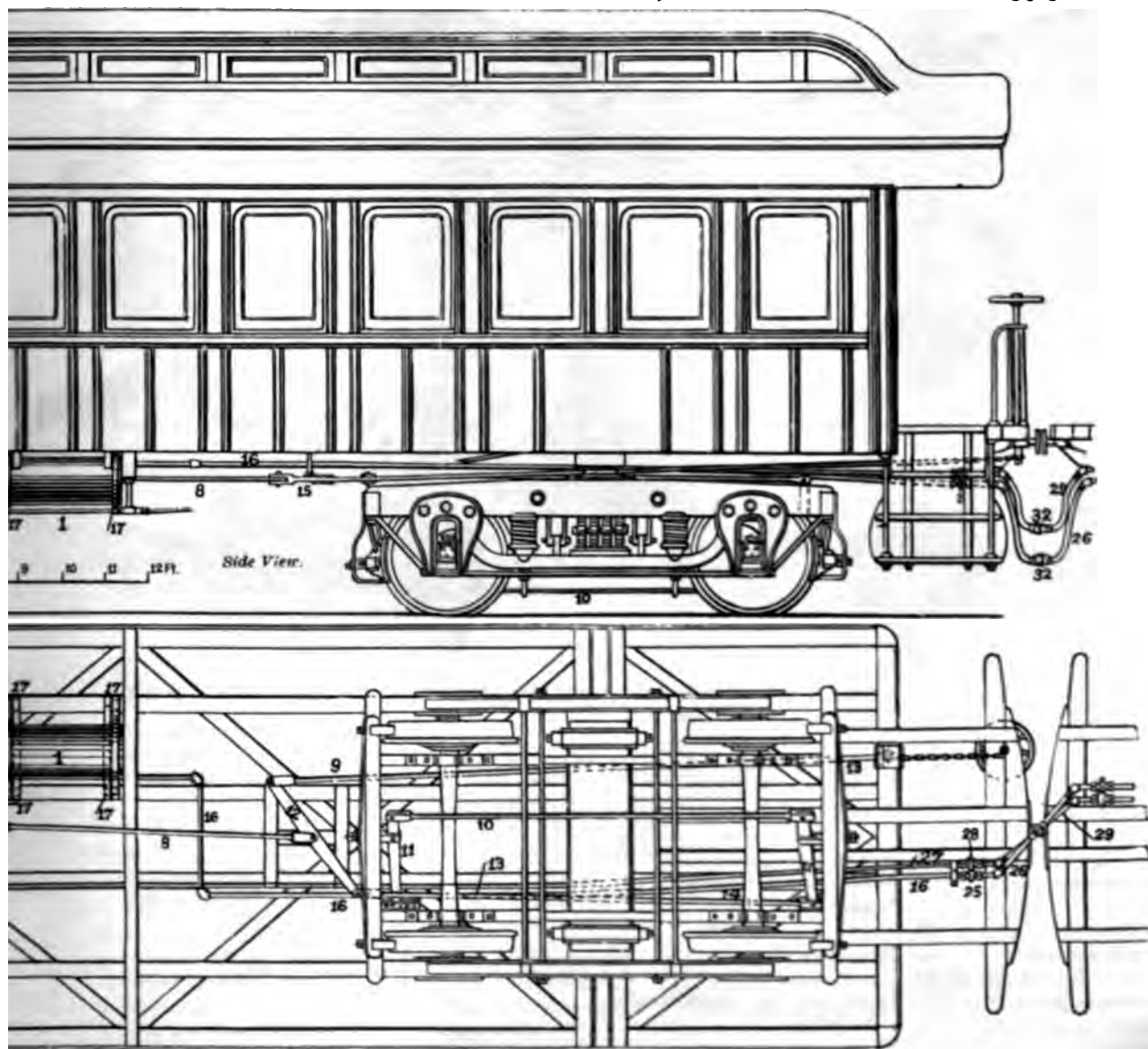


Fig. 324.

Numbers refer to List of Names of Parts on following page.



(The Train Signaling Apparatus is shown more fully in Figs. 337-331.)

Fig. 326. CAR-BODY DETAILS, Brake-gear, Air; Westinghouse.



Fig. 326.
GENERAL VIEW OF AUXILIARY RESERVOIR, BRAKE
CYLINDER AND ATTACHED PARTS, WITH
SECTION OF TRIPLE-VALVE.

(Shown attached to car on previous page.)

(Also shown on previous page.)

NAMES OF PARTS OF CAR BRAKE GEAR AND TRAIN SIGNAL
APPARATUS ; Figs. 324-325 on previous page.

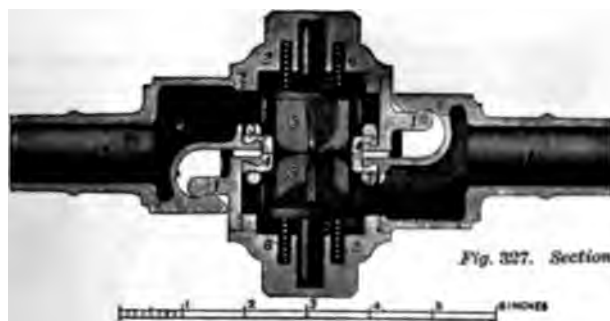
- | | |
|--|---|
| 1. Auxiliary Reservoir, for Car-brake. | 17. Auxiliary-reservoir Bands. |
| 2. Brake-cylinder, for Car-brake. | 18. Cylinder Release-cock. |
| 3. Cross-head. | 19. Auxiliary-reservoir Nipple. |
| 4. Cylinder-lever Bracket. | 20. Triple-valve Branch-pipe. |
| 5. Triple-valve. | 21. Brake-cylinder Pipe. |
| 6. Drain-cup. | 22. Conductor's Valve. |
| 7. Cylinder-levers. | 23. Conductor's-valve Pipe. |
| 8. Floating Connecting-rod. | 24. Conductor's-valve Discharge-pipe. |
| 9. Brake-shaft Connecting-rod. | 25. Stop-cock, for Brake-pipe. |
| 10. Lower Brake-rod. | 26. Brake-hose and Coupling. |
| 11. Brake Lever. | 27. Signal-pipe. |
| 12. Floating Lever. | 28. Signal-pipe Stop-cock. |
| 13. Secondary Brake-rod. | 29. Signal-hose. |
| 14. Cylinder-lever Tie-rod. | 30. Signal-valve. |
| 15. Cylinder-lever Support. | 32. Brake-hose (or Signal-hose) Coupling. |
| 16. Brake Pipe. | |

NAMES OF PARTS OF TRIPLE-VALVE

- | | |
|-------------------------|-----|
| A. Drain-cup. | 7. |
| B. Piston-chamber. | 8. |
| C. Slide-valve Chamber. | 9. |
| a to g. Air-passages. | 10. |
| 2. Triple-valve Case. | 11. |
| 3. Lower Cap. | 12. |
| 4. Upper Cap. | 13. |
| 5. Piston. | 14. |
| 6. Slide-valve. | |

(See note to Fig. 324.)

(The reference numbers and letters are the same as used in the makers' lists.)



BRAKE-HOSE COUPLING, WITH VALVES
(for "Straight-air" system, non-automatic).



BRAKE-HOSE COUPLING, WITHOUT VALVES
(for automatic system).

NAMES OF PARTS; Figs. 327-328.

1. Coupling-case.
2. Coupling-cap.

3. Coupling Packing-ring Washer.
4. Coupling Packing-ring.

5. Coupling-valve.
6. Coupling-valve Spring.

(Couplings for Train Signaling Apparatus, Figs. 687-691, are similar, but made with thicker lips, so as not to intercouple with brake-hose.)



Fig. 329. Section.

STANDARD 10-INCH CYLINDER (for standard-gauge passenger cars).



Fig. 330. Section.
TENDER CYLINDER.

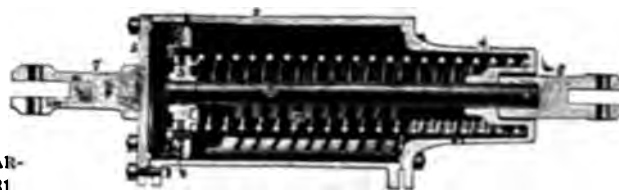


Fig. 331. Section.

EIGHT-IN. CYLINDER (for narrow-gauge passenger cars).

NAMES OF PARTS OF CAR-CYLINDERS; Figs. 329 and 331.

2. Cylinder-body.
3. Piston and Piston-rod.
4. Back Cylinder-head.
5. Front Cylinder-head.
6. Cross-head.
7. Cylinder Lever-bracket.

8. Piston Follower-plate.
9. Piston Packing-leather.
10. Piston Packing-leather Expander.
11. Piston Follower-bolt.
12. Release-spring.

(See note to Fig. 322.)

(For external views of these parts, see Figs. 303-7-9.)

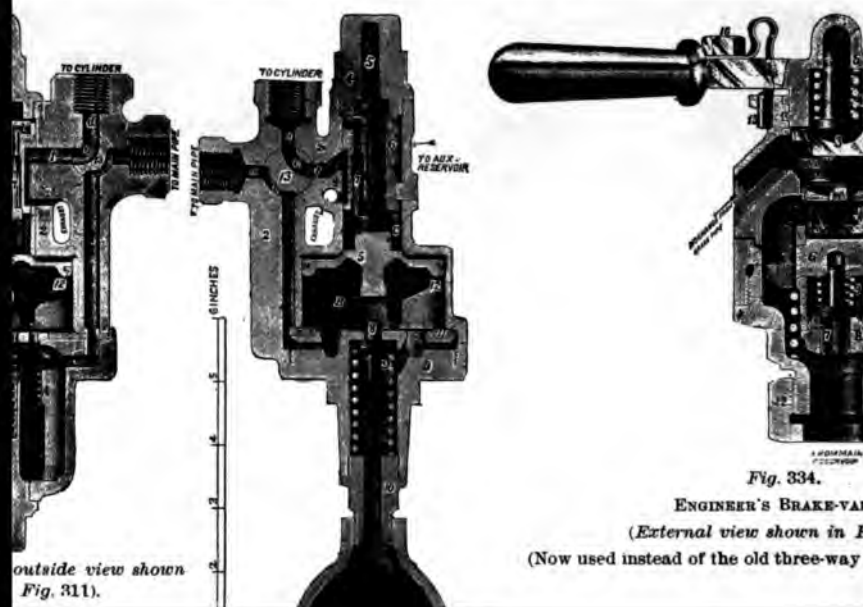
(The reference numbers are the same as used in the makers' lists.)

NAMES OF PARTS OF TENDER-CYLINDER; Fig. 330.

2. Cylinder-body.
3. Piston and Piston-rod.
4. Back Cylinder-head.
5. Front Cylinder-head.
6. Piston-sleeve.
7. Piston Follower-plate.
8. Piston Packing-leather.
9. Piston Packing-leather Expander.
10. Release-spring.
11. Piston Follower-bolt.

(See note to Fig. 322.)

CAR-BODY DETAILS, Brake-gear, Air; Westinghouse.



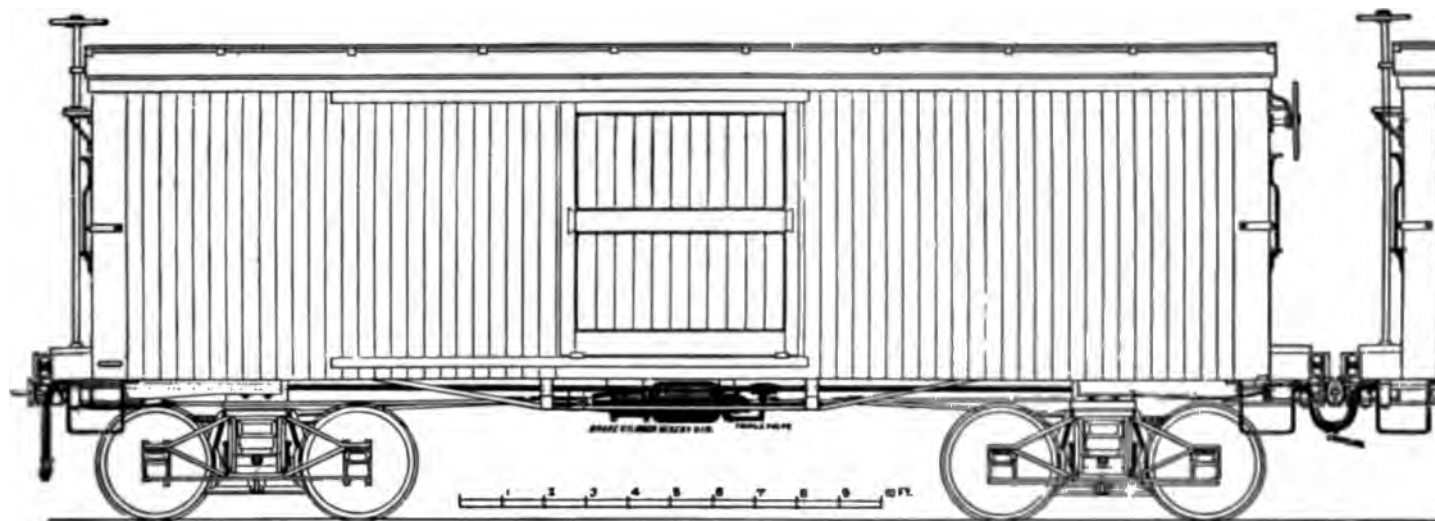


Fig. 336. Side Elevation.

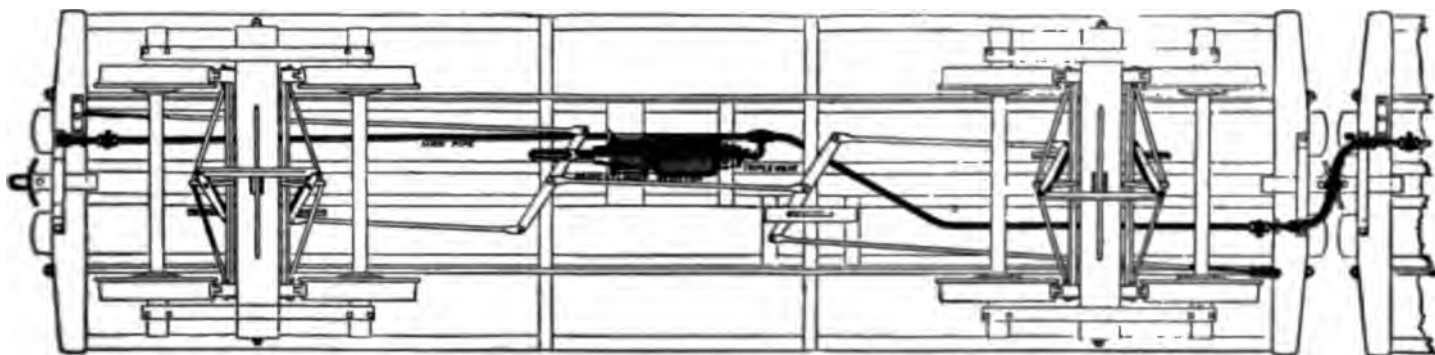


Fig. 337. Isolated Plan.

WESTINGHOUSE AUTOMATIC FREIGHT-BRAKE.

Brake-cylinder, shown in detail in Fig. 332.

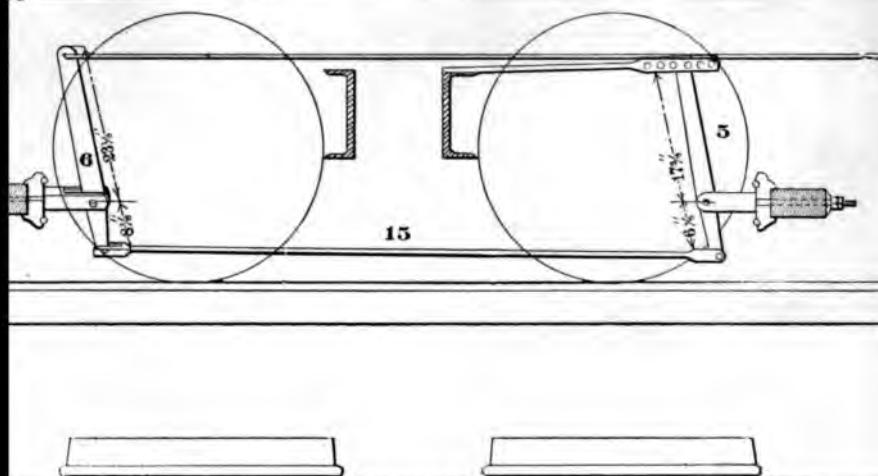
Hook-coupling, " " " " Figs. 337-338.

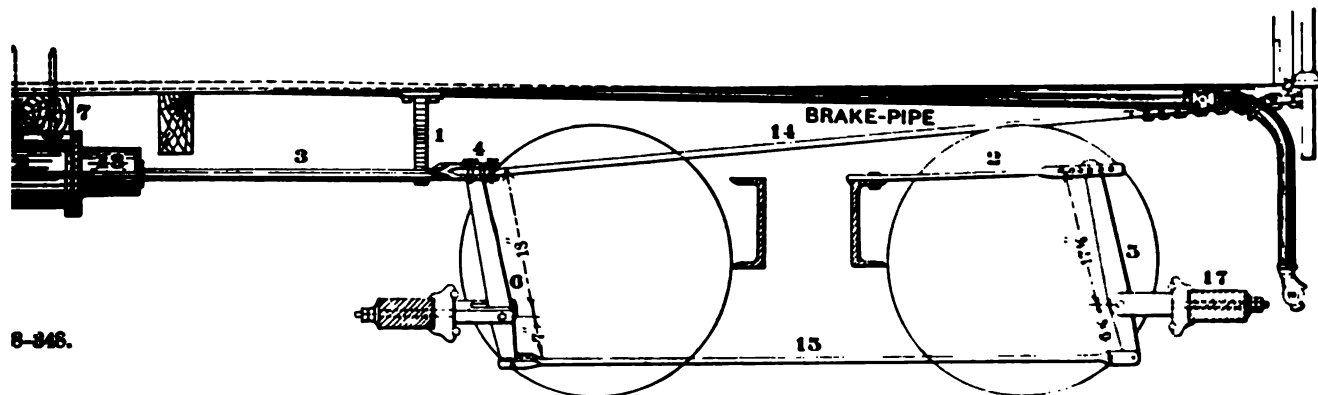
Triple-valve, " " " " Figs. 339-340.

(A different arrangement)

shown on following page.)

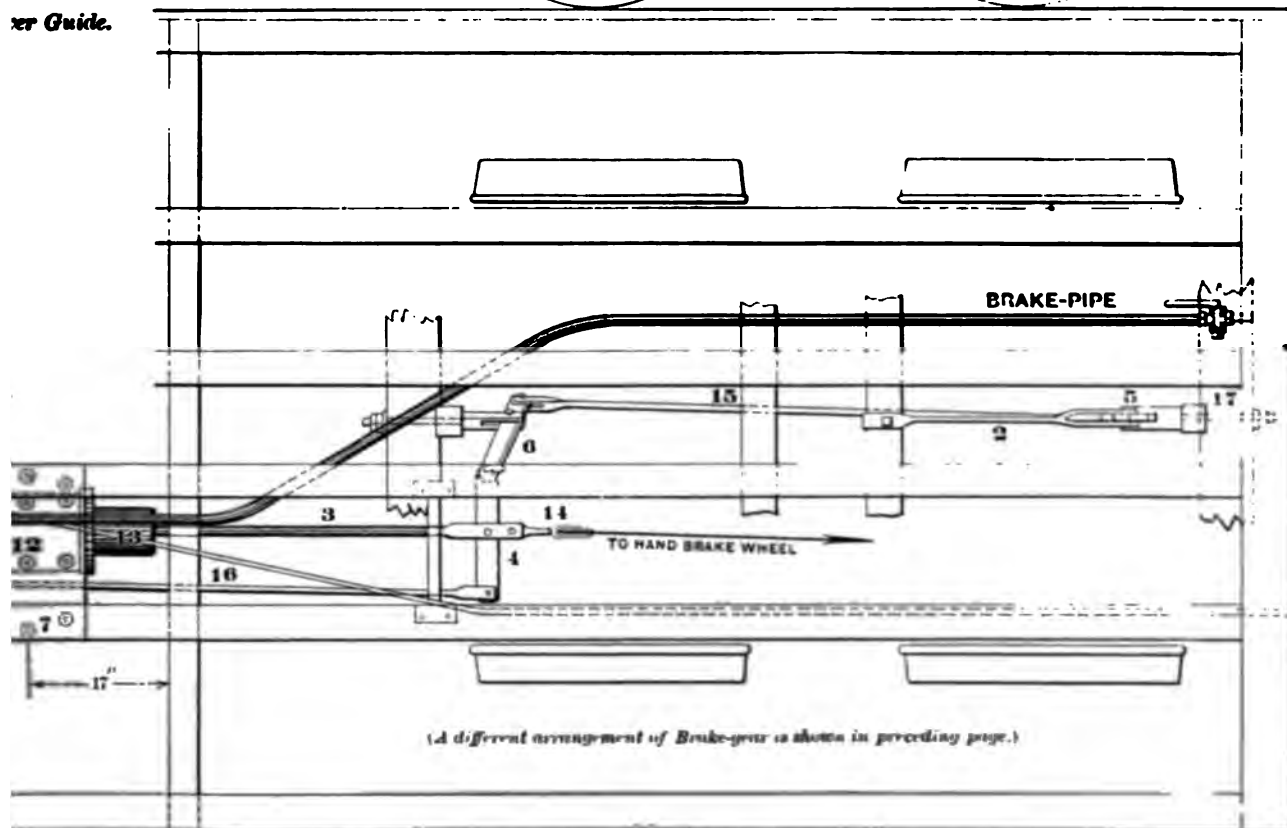
338-339. CAR-BODY DETAILS, Brake-gear, Air; *Westinghouse.*





8-346.

per Guide.



(A different arrangement of Brake-gear is shown in preceding page.)

s. 340-349. CAR-BODY DETAILS, Brake-gear, Air; Westinghouse.

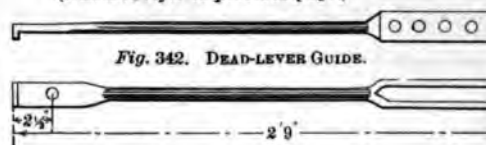
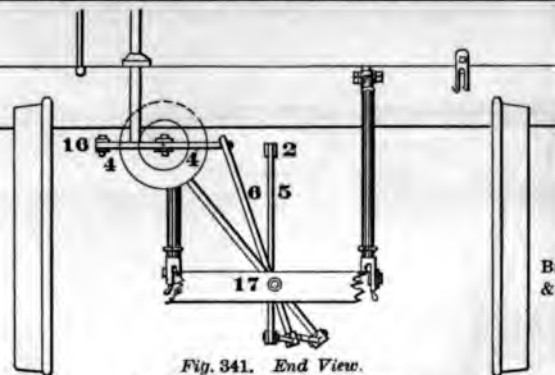
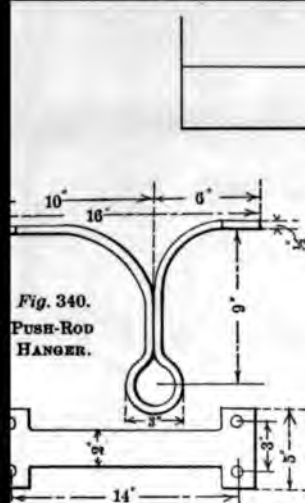




Fig. 350.

AUXILIARY BRAKE-VALVE. (*Little used.*) (*Outside view; 33, Fig. 311.*)
(For use with Automatic Brake on extra heavy gradients, in either passenger or freight service.)

AUXILIARY BRAKE-VALVE COMPLETE; No. 33, PLATE A5.

NAMES OF PARTS: Fig. 350.

- | | |
|--------------------------|--------------------------|
| 1. Valve-case. | 8. Spring Guide. |
| 2. Upper Cap. | 9. Piston. |
| 3. Graduating Handle. | 10. Upper Spring. |
| 4. Bottom Cap. | 11. Piston Packing-ring. |
| 5. Reservoir-pipe Union. | 12. Central Valve. |
| 6. Brake-pipe Union. | 13. Lower Spring. |
| 7. Bracket-nut. | |

WESTINGHOUSE FREIGHT-BRAKE.

NAMES OF PARTS OF COMBINED RESERVOIR AND CYLINDER; Fig. 352.

2. Cylinder-body.
3. Piston and Piston-rod.
4. Cylinder head.
5. Cross-head.
6. Piston-follower.
7. Piston Packing-leather.
8. Piston Packing-expander.
9. Release-spring.
10. Reservoir.
11. Triple valve.
- a. Triple-valve Air-pipe.
- b. Leakage-groove.

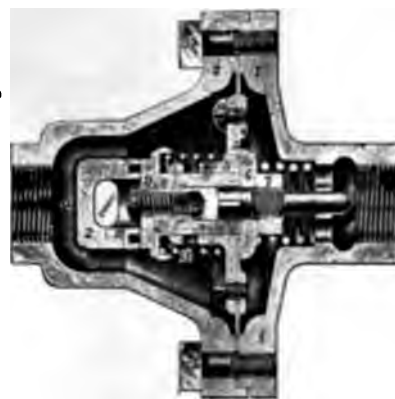


Fig. 351.

AUXILIARY DISCHARGE-VALVE. (*Outside view; 56, Fig. 311.*)
(For Freight-brake; designed to be used with extra long trains, but not yet in use and intended only for exceptional use.)

NAMES OF PARTS: Fig. 351.

- | | |
|---------------------------|-----------------------------|
| 1. Front Cap. | 9. Discharge-valve Face. |
| 2. Valve-body. | 10. Discharge-valve Seat. |
| 3. Diaphragm. | 11. Discharge-valve Screw. |
| 4. Front Diaphragm-plate. | 12. Diaphragm-screw. |
| 5. Back Diaphragm-plate. | 13. Discharge-valve Spring. |
| 6. Diaphragm Seat. | 14. Diaphragm-spring. |
| 7. Diaphragm seat Nut. | 15. Cap-screw. |
| 8. Discharge-valve. | |

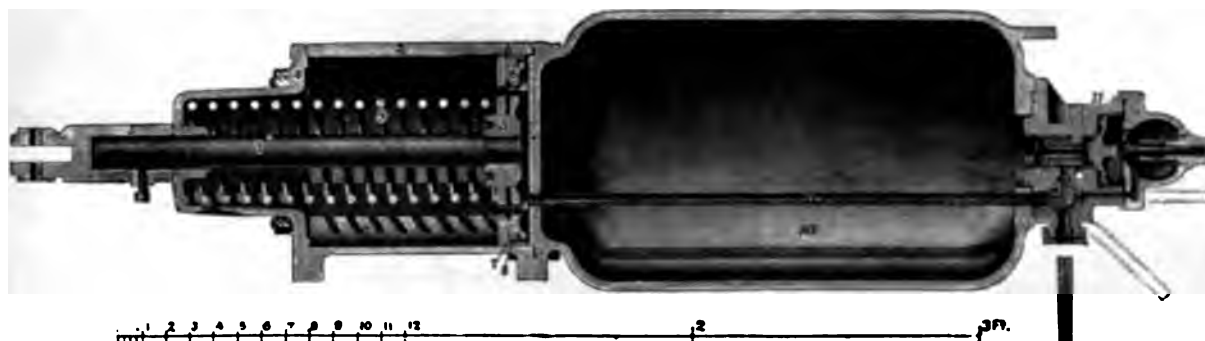
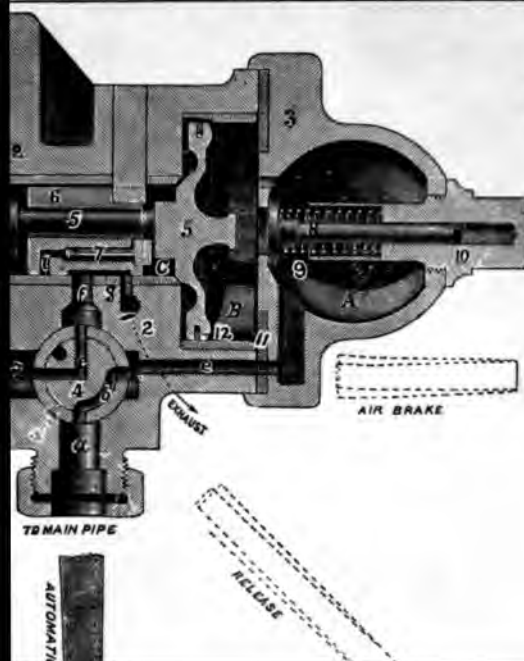


Fig. 352.

COMBINED TRIPLE-VALVE, RESERVOIR AND BRAKE CYLINDER FOR WESTINGHOUSE FREIGHT-BRAKE.
(Triple-valve shown in detail in Fig. 353.)

(The reference numbers are the same as used in the makers' lists.)

WESTINGHOUSE FREIGHT BR



NAMES OF

- A. Air-chamber.
- B. Cylinder.
- C. Valve-chamber
- a. to i. Air-passa
- 2. Triple-valve (
- 3. Drain-cup.
- 4. Four-way Co
- 5. Piston.
- 6. Slide-valve.
- 7. Graduating-
- 8. Graduating-s
- 9. Graduating-s
- 10. Graduating-s
- 11. Triple-valve (
- 12. Piston Packi

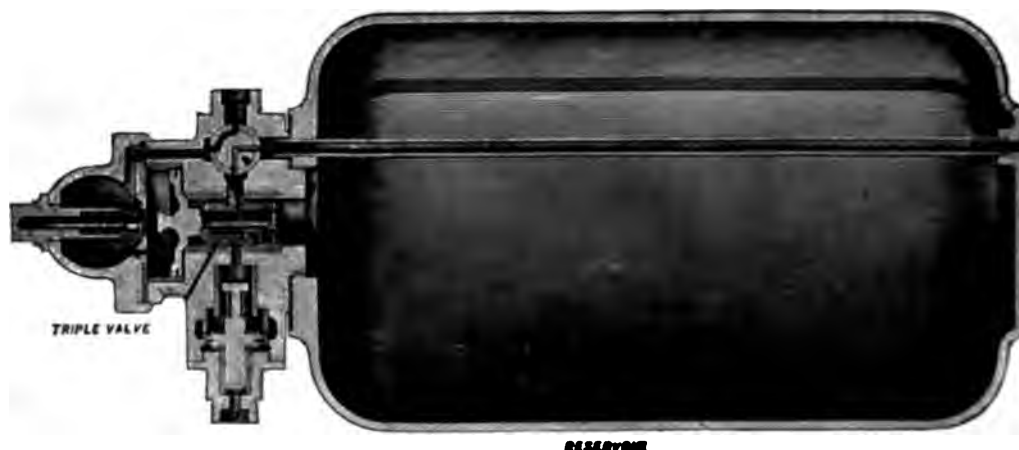


Fig. 355. RESERVOIR AND TRIPLE VALVE COMBINED (for freight service)

(The Triple Valve here shown is the same as shown in Figs. 356-357 below, but Fig. 355 is considered the preferable form.)

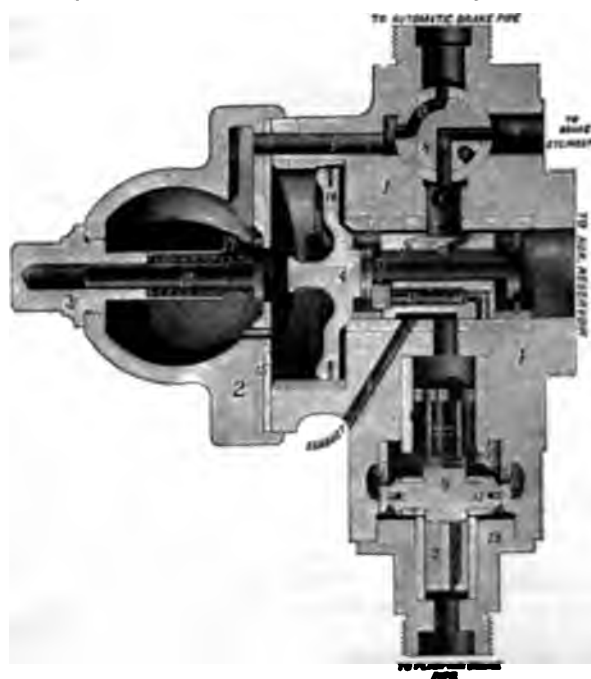


Fig. 356. Vertical Section.

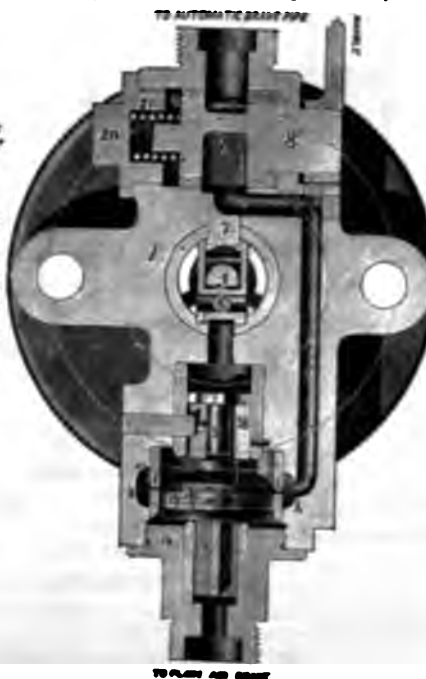
TRIPLE VALVE with DOUBLE CHECK (little used).
(For both passenger and freight service.)

Fig. 357. Horizontal Section.

NAMES OF PARTS;
Figs. 355-357.

1. Triple-valve Case.
2. Drain-cup.
3. Drain-cup Nut.
4. Piston.
5. Slide-valve.
6. Graduating-valve.
7. Guide-pin.
8. Four-way Cock Plug.
9. Double-check Valve.
10. Upper-valve Bushing.
11. Double-check Valve-face.
12. Lower-valve Bushing.
13. Double-check Valve Packing-ring.
14. Piston Packing-ring.
15. Triple-valve Gasket.
16. Graduating-stem.
17. Graduating-spring.
18. Auxiliary Release-valve.
19. Double-check Valve Cap.
20. Four-way Cock Cap.
21. Four-way Cock Spring.

(See note to Fig. 352.)

(The reference numbers are the same as used in the makers' lists.)

CAR-BODY DETAILS, Brake-gear, Steam; "American" Brake.

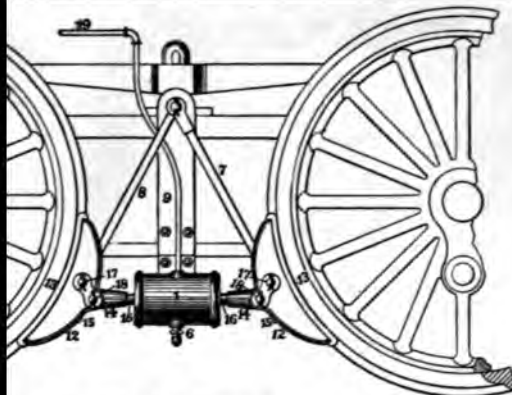


Fig. 358. Side Elevation.
HORIZONTAL-CYLINDER STEAM-DRIVER BRAKE.

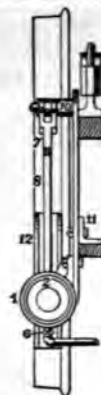


Fig. 358 1/2. Transverse Elevation.

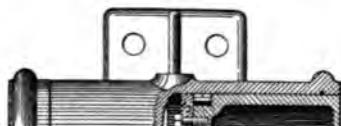
American Brake Co.'s Steam Brake-gear; Figs. 358-360.



Fig. 360.
Elevation.



Fig. 361. Lower
valve Shell
Figs. 360-362. STEAM



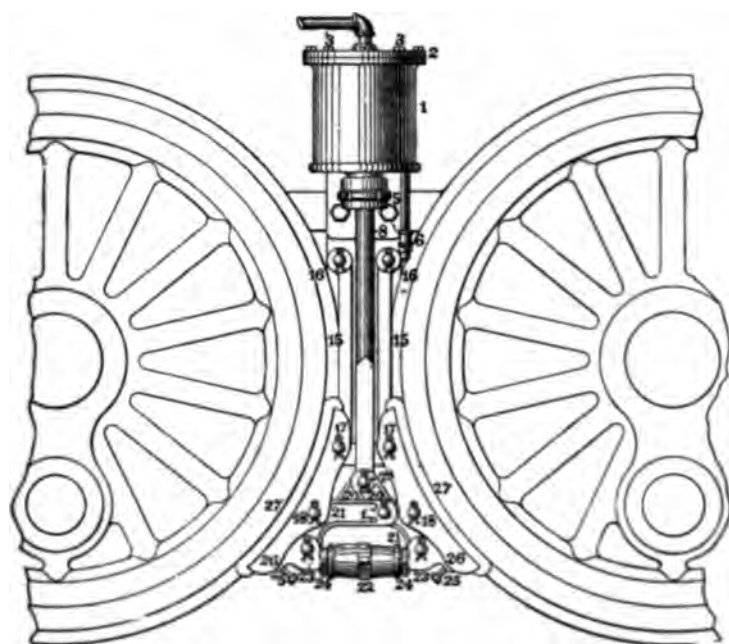


Fig. 363. Side Elevation.

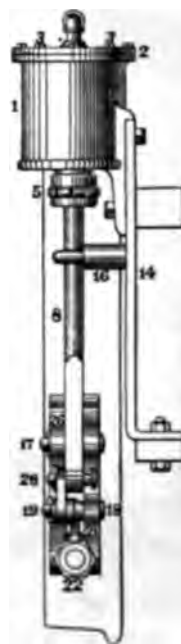


Fig. 364. Transverse Elevation.

BELL-CRANK STEAM DRIVER BRAKE.

NAMES OF PARTS OF BELL-CRANK DRIVER BRAKE ; Figs. 363-365.

- | | | |
|---------------------------|--------------------------------------|----------------------|
| 1. Cylinder. | 11. Piston Packing-ring. | 20. Link. |
| 2. Cylinder-head. | 12. Piston-rod Nut. | 21. Bell-crank. |
| 3. Cylinder-head Bolt. | 13. Automatic Drip Valve for Piston. | 22. Turnbuckle. |
| 4. Piston-gland. | 14. Face-plate | 23. Push-bar. |
| 5. Gland Spanner-nut. | 15. Brake-shoe Hanger. | 24. Lock Nut. |
| 6. Automatic Drip-valve. | 16. Hanger Stud. | 25. Adjusting-screw. |
| 7. Piston-head. | 17. Hanger Pin. | 26. Brake-block. |
| 8. Piston-rod. | 18. Bell-crank Pin. | 27. Brake-shoe. |
| 9. Piston-follower. | 19. Link Pin. | 28. Piston-rod Pin. |
| 10. Piston-follower Bolt. | | |

(All to be specified as for Bell-crank Driver Brake.)

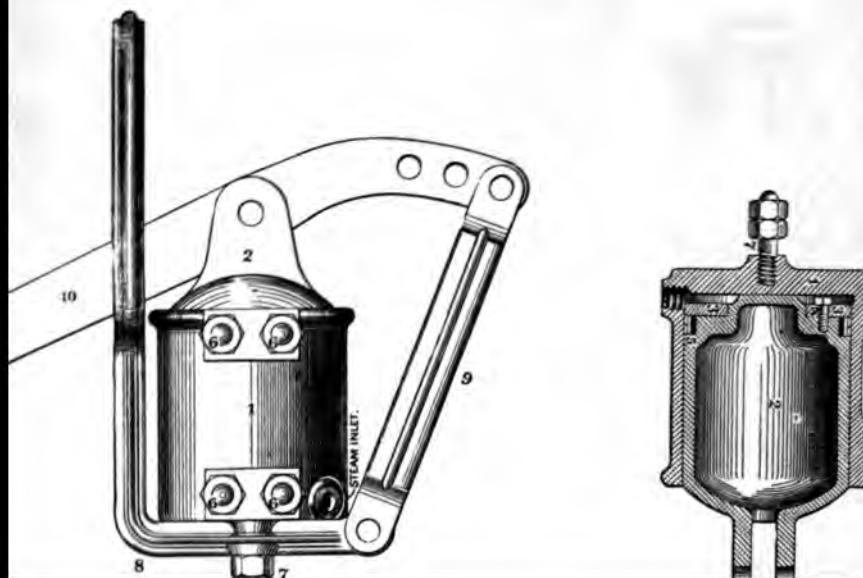
(Two other styles of driver brakes are manufactured by the same company, one with spiral springs interposed for transmitting the pressure to the brake-blocks and the other a single driver brake operated by a system of levers.)

(The reference numbers are the same as used in the makers' lists.)



Fig. 365. Section of Brake Cylinder.

CAR-BODY DETAILS, Brake-gear, Steam ; "American" Brake.



**NAMES OF PARTS OF
BRAKE-GEAR; Figs.
308-309.**

1. Axle-clamp.
2. Governor-blocks.
3. Governor-block Springs.
4. Governor-spring Thimble.
5. Disk.
6. Fork.
7. Fork-bracket.
8. Lower Bell-crank Rod.
9. Tail-nut.
10. Lock-nut.
11. Bell-cranks.
12. Lower Bell-crank Bracket.
13. Upper Bell-crank Bracket.
14. Upper Bell-crank Rod.
15. Push-bar.
16. Pendant-lever.
17. Locking-pawl.
18. Release-chain.
19. Release-chain Eye-bolt.

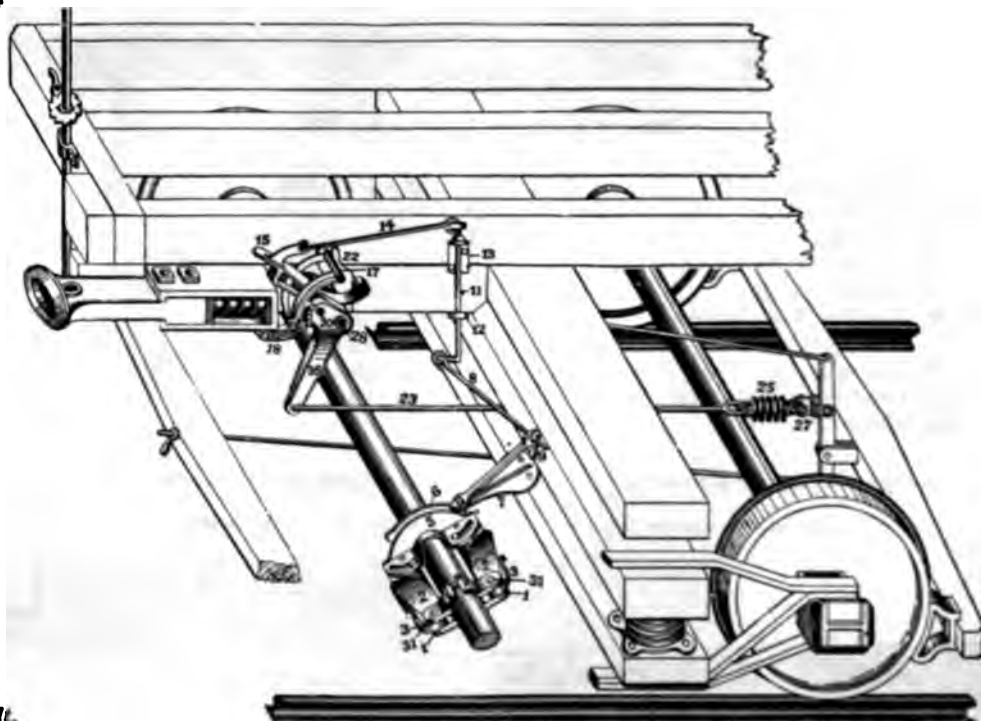


Fig. 308. Perspective View.

AUTOMATIC FREIGHT-CAR COMPRESSION BRAKE.
(American Brake Co.)

(Designed to be operated preferably, but not necessarily, in connection with the locomotive and tender brake, Figs. 356-367.)

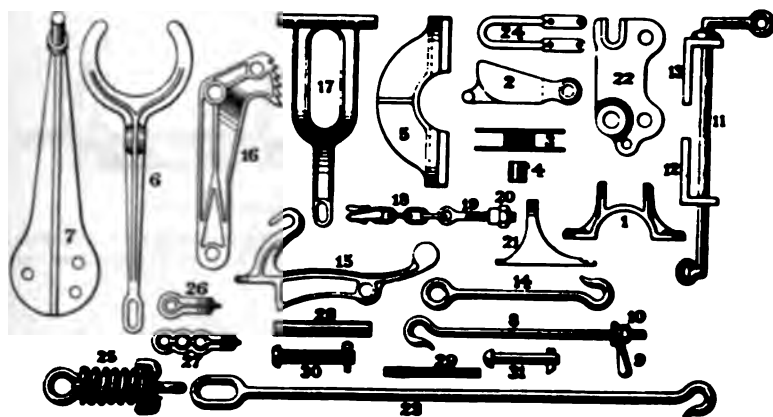


Fig. 309. Separate Views of Details in Fig. 308.

(The reference numbers are the same as used in the makers' lists.)

- | | |
|-----------------------------------|---------------------------------|
| 20. Release Nut. | 27. Three-hole Clevis. |
| 21. Release Bracket. | 28. Pendant-lever Fulcrum-pin. |
| 22. Check-plates. | 29. Stop-pin. |
| 23. Lower Connecting-rod. | 30. Push-bar Pin and Cutter. |
| 24. Lower Connecting-rod Stirrup. | 31. Governor-block Pin and Key. |
| 25. Relief-spring. | |
| 26. Single-hole Clevis. | |

DOORS.

NAMES OF PARTS OF DOORS; Fig. 370.

st or Jamb.	12. Upper Door-sash.
ullion.	13. Lower Door-sash.
ame-plate.	14. Door-sash Bolt.
or-rail.	15. Door-sash Plate.
Door-rail.	16. Door-hinge.
or Lock Door-rail.	17. Door-knob.
Door-rail.	18. Door-lintel.
le.	19. Door-lock.
or Twin Door-panels.	20. Door-lock Keeper.
Door-panel.	

For names of parts surrounding doors, DOOR-SILL, DOOR-POST, DOOR-LINTEL, etc.,
see CAR-BODIES; PASSENGER.)

See also FURNISHINGS, DOOR, and FURNISHINGS, LOCKS, for further details.)



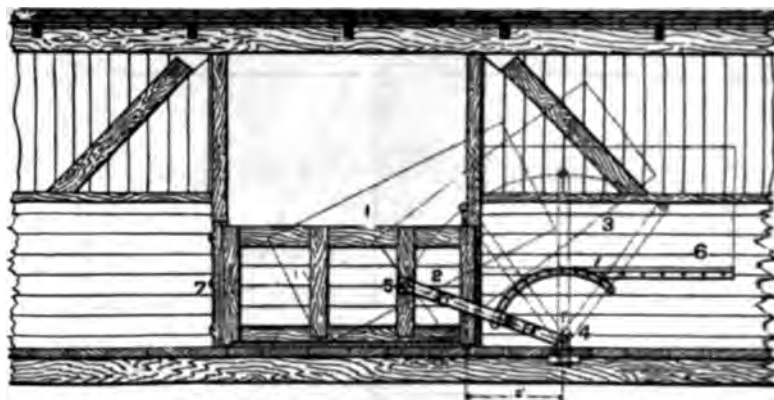


Fig. 373. Side Elevation; Inside View.

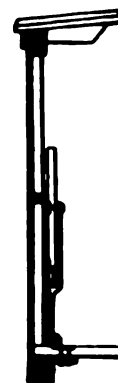


Fig. 374.

Cross Section at rear end of door.



Fig. 375. Plan.

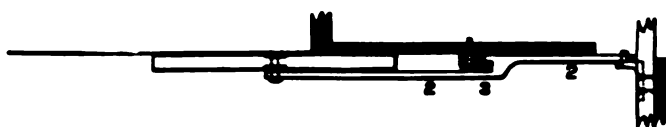


Fig. 376.

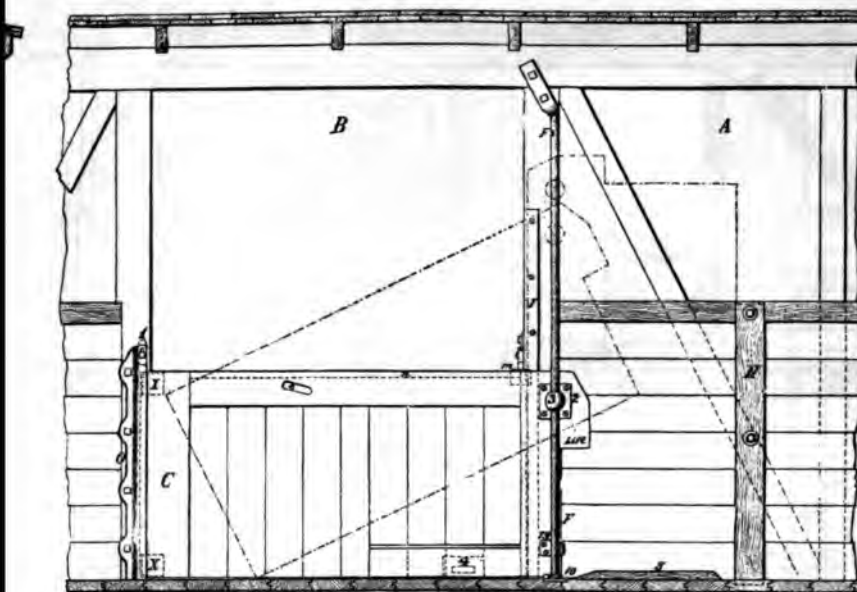
Section through Guide-bars.

SUGENIEL & MILLER GRAIN-DOOR.

NAMES OF PARTS; Figs. 373-376.

- | | |
|---------------------|-----------------------|
| 1. Grain-door. | 5. Guide-bar Plate. |
| 2. Guide-bar. | 6. Grain-door Rest. |
| 3. Segment. | 7. Grain-door Keeper. |
| 4. Guide-bar Pivot. | |

CAR-BODY DETAILS, Doors ; Grain Doors.



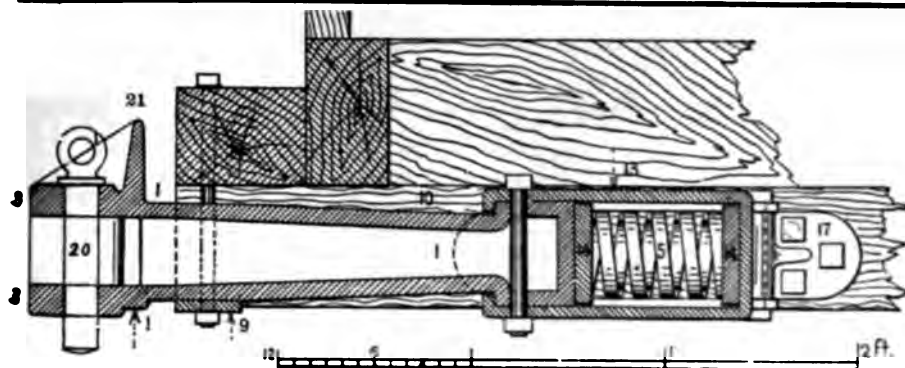


Fig. 383. Longitudinal Section.

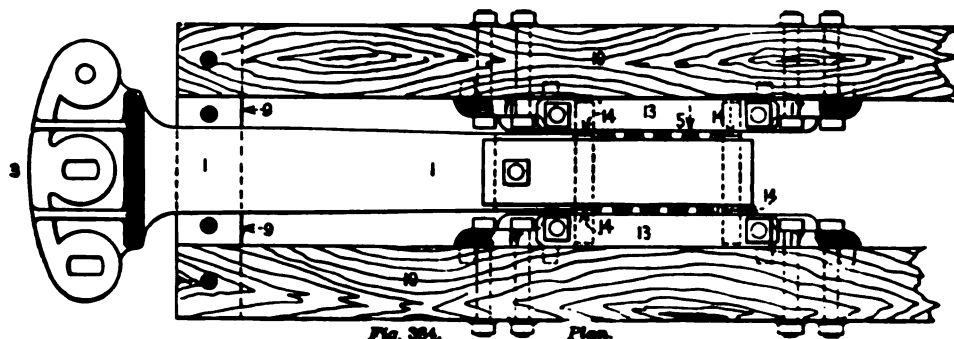


Fig. 384. Plan.

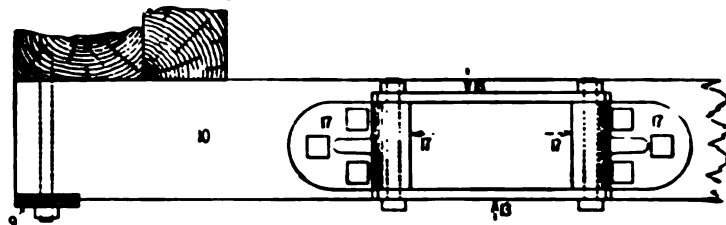


Fig. 385. Longitudinal Section, with Drawbar Removed.

FREIGHT-CAR DRAW-GEAR, WITH POTTER DRAWBAR, CHICAGO, BURLINGTON & QUINCY RAILROAD.

NAMES OF PARTS OF DRAW-GEAR; Figs. 383-386.

- | | | |
|----------------------------|-------------------------|--|
| 1. Drawbar. | 7. Drawbar Bolt. | 12. Draw-timber Tie-bar. |
| 2. Drawbar Face-plate. | 8. Draw-spring Stop. | 13. Drawbar Guides. |
| 3. Drawbar Head. | 9. Drawbar Carry-iron. | 14. Drawbar Follower-plates. |
| 4. Drawbar Distance-piece. | 10. Draw-timbers. | 15. Auxiliary Drawbar Follower-plates. |
| 5. Draw-spring. | 11. Draw-timber Guards. | |

(Parts in Roman type, not shown in this draw-gear.)

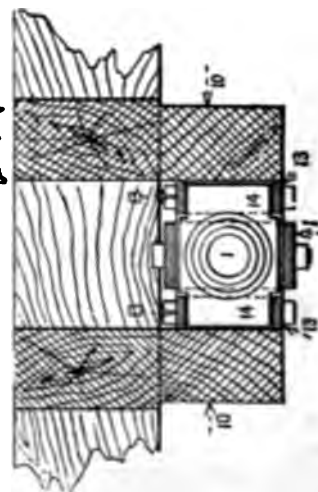


Fig. 386. Transverse Section.

- | |
|-------------------------|
| 16. Drawbar Jaw. |
| 17. Drawbar Stop. |
| 18. Draw-timber Pocket. |
| 19. Draw-rod. |
| 20. Coupling-pin. |
| 21. Buffer Safety-lug. |

CAR-BODY DETAILS, Draw-gear; Freight.

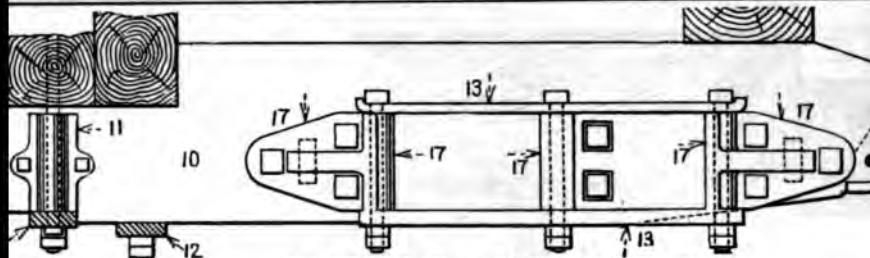


Fig. 387. Side View, with Drawbar Removed.

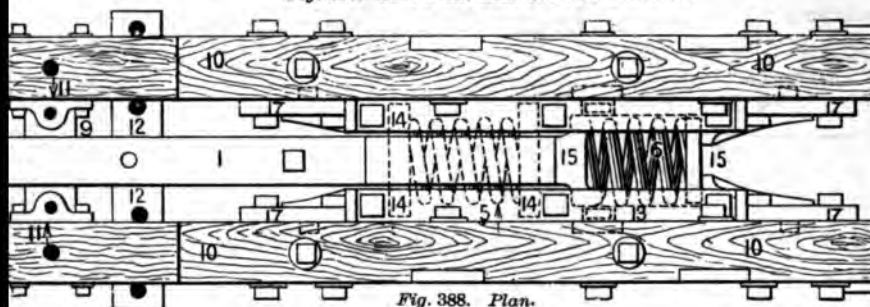
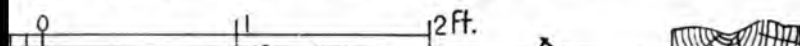


Fig. 388. Plan.



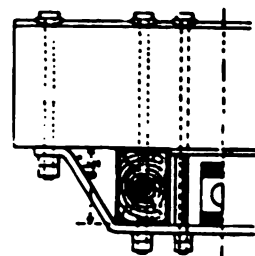


Fig. 202.
Transverse Section.

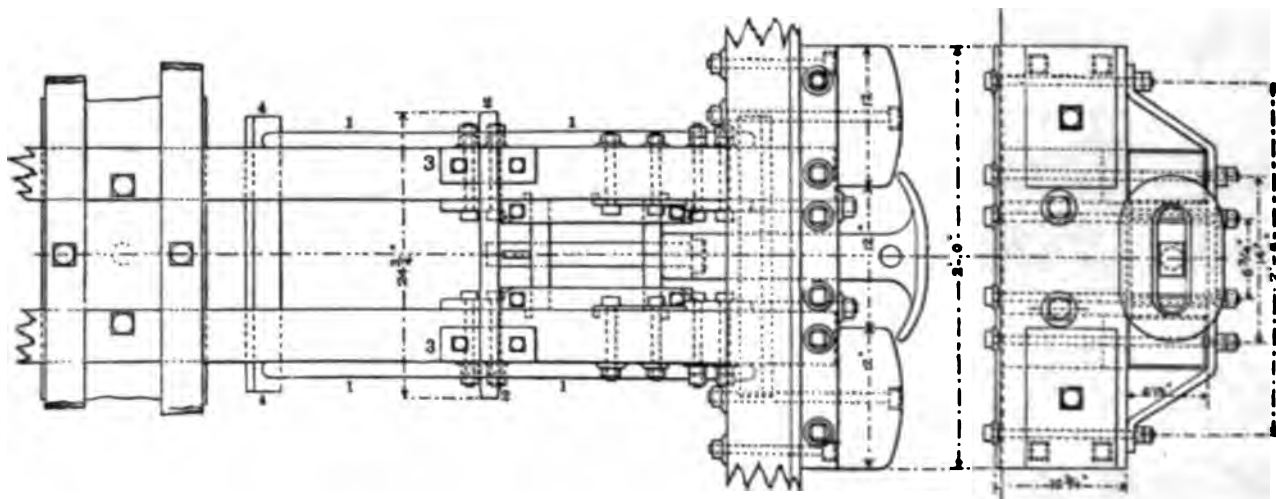


Fig. 304. End Elevation.

FREIGHT CAR DRAW-GEAR, NORFOLK & WESTERN RAILROAD.

1. *Draw-timber Carry-iron.*
2. *Draw-timber Carry-iron Pin.*

3. *Draw-timber Carry-iron Pin-plates.*
4. *Draw-timber Carry-iron Washer-plates.*

CAR-BODY DETAILS, Draw-gear; Freight.

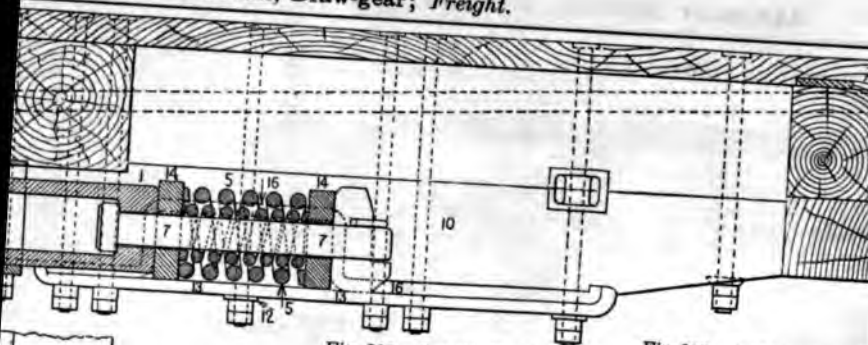


Fig. 395. Longitudinal Section.

Fig. 398. Section through

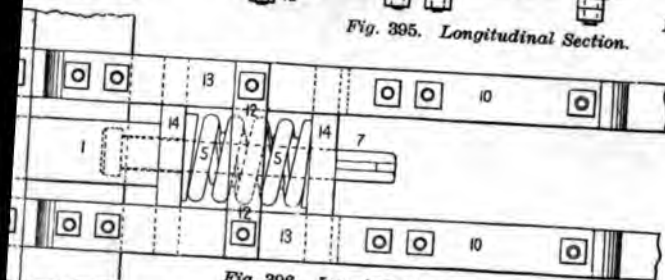
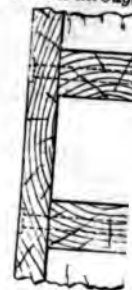
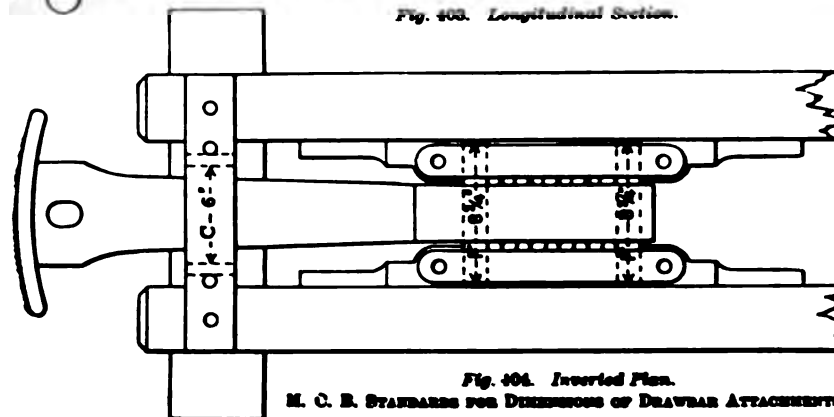
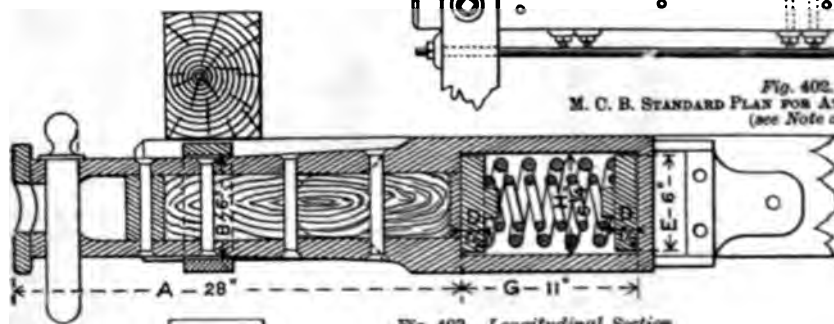
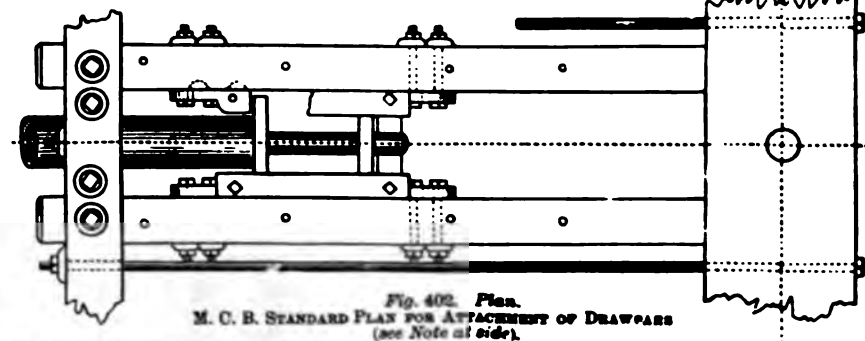
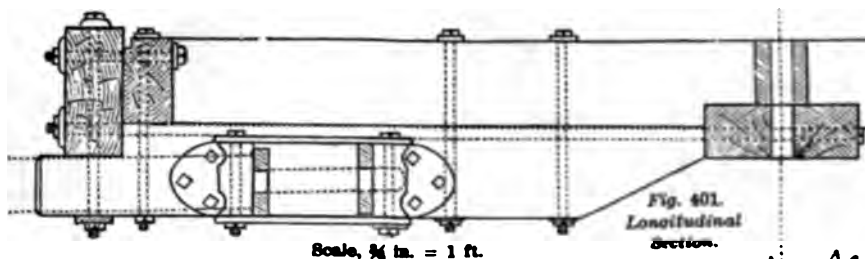


Fig. 396. Inverted Plan.



(At the Tenth Annual Convention of the Master Car-Builders' Association, New York, 1876, the mode of attachment of drawbars at their rear end, shown in Figs. 401-402, was recommended for general use; and all future application of such attachments below the timber under the car-bodies, in the manner "alluded to in report of Committee," were discountenanced. This drawing, however, is now superseded by the plan below, so far as the two differ from each other.)



Adopted at 13th Annual Convention of the Master Car-Builders' Association, Chicago, 1879, as follows:

Length, *A*, from the end of drawbar to the first follower-plate to be 28 in.

Depth, *B*, at outer yoke in drawbar carry-iron, 6 in.

Width, *C*, for drawbar carry-iron or yoke, 6 in.

Follower-plates to be wrought-iron, rectangular in form; thickness, *D*, to be $1\frac{1}{4}$ in.; width, *E*, 6 in., and length, *F*, $8\frac{3}{4}$ in.

Length, *G*, of the MOON OF THE DRAWBAR, 11 in., and width, *H*, $6\frac{1}{4}$ in.

Pin-hole in drawbar to take a pin $2 \times 1\frac{1}{4}$ in.

When a STRAP (Fig. 430) is used at back end of drawbar, to have a clear space of 11 in. long and $6\frac{1}{4}$ in. wide.

When a SPRING (Fig. 440) is used, to be 2 in. diameter, 17 in. long from under side of head to outer edge of key; key to be $2\frac{3}{4}$ in. wide and $\frac{1}{4}$ in. thick.

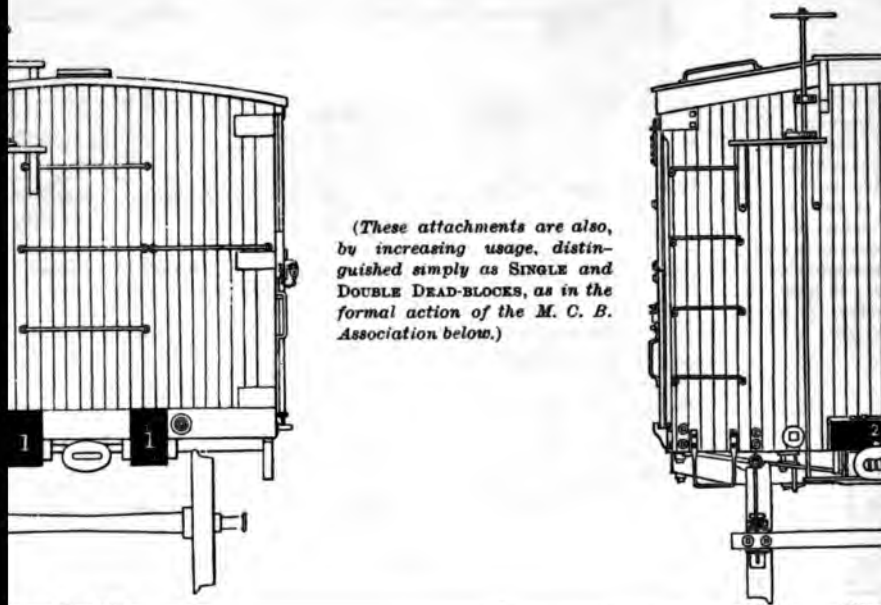
The drawbars to be so placed in the cars as to locate the coupling-pins not less than five inches from the centre to the face of the dead-woods.

(As to the distance, *K*, the intention of the action taken by the Convention is doubtful.)

At the same meeting it was recommended that the CAPACITY OF DRAW- AND BUFFER-SPRINGS should not be less than 12,000 lbs.

Also, that when the CURVED DRAWBAR (Figs. 434-7) is used, the length and size of drawbar shall be the same as above.

CAR-BODY DETAILS, Draw-gear; Freight. (Standards.)



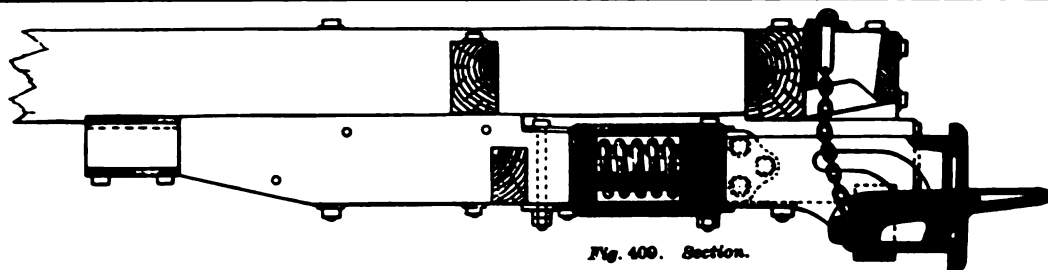
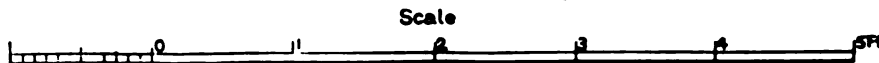


Fig. 400. Section.



NOTE.—The couplers shown in Figs. 400-423, together with the WILSON-WALKER and CONWAY-BALL couplers (not shown for lack of drawings), are those recommended for further trial by the Master Car-builders' Association, but are none of them as yet in general use. See AUTOMATIC CAR-COUPLER in Dictionary.

Figs. 400-411.

AMES AUTOMATIC FREIGHT CAR COUPLER.
(Showing Slotted Draw-head, Hooked Coupling-link,
Uncoupling-rod and Uncoupling-chain.)

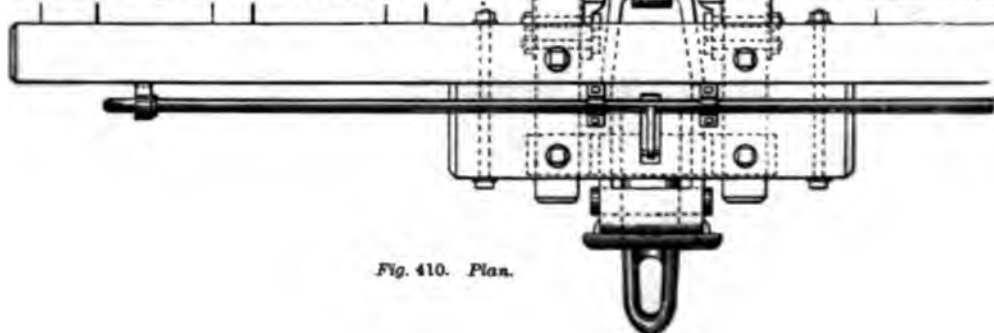


Fig. 410. Plan.

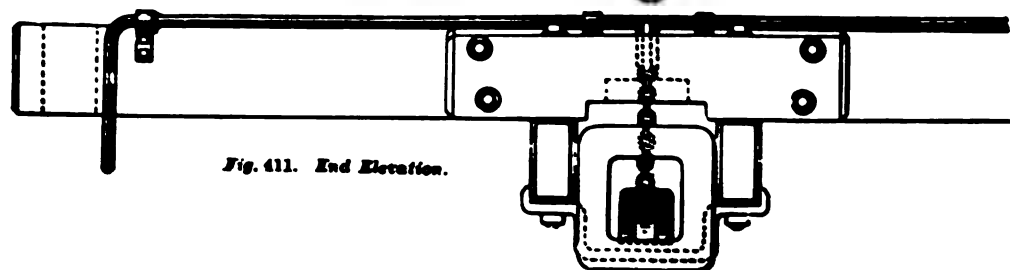


Fig. 411. End Elevation.

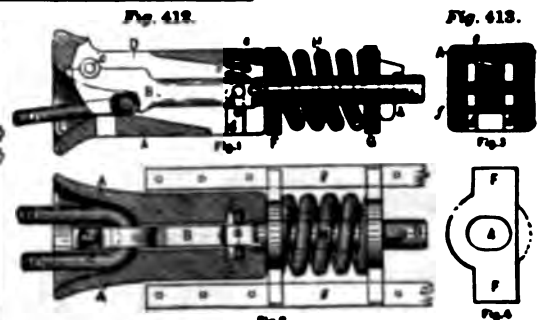


Fig. 412.

Fig. 413.

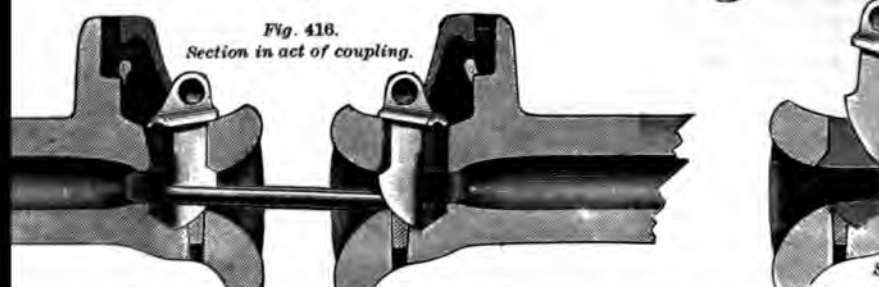
Fig. 414.

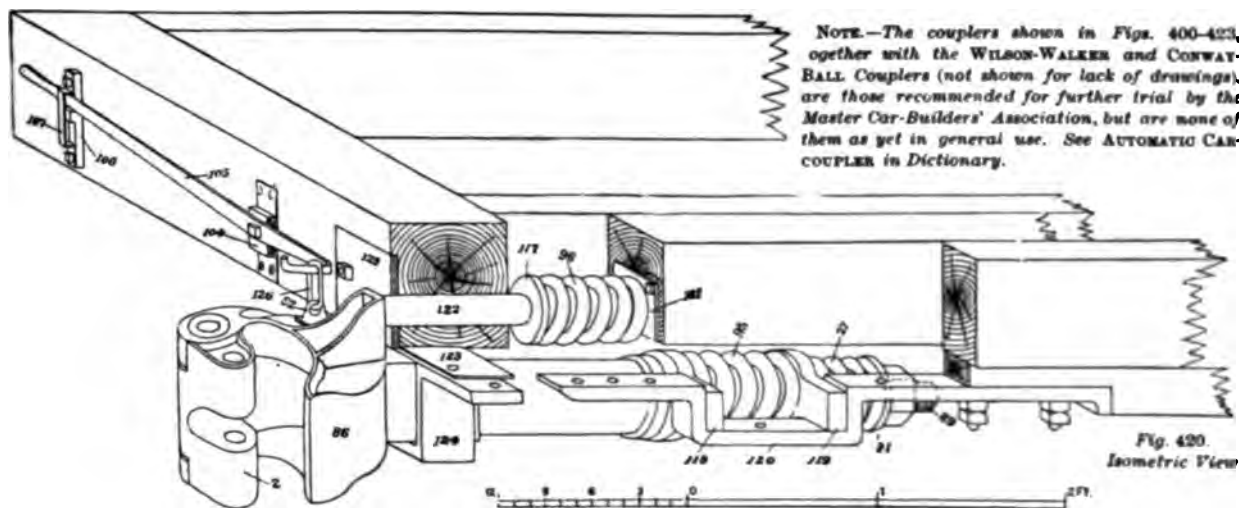
ARCHER AUTOMATIC FREIGHT CAR COUPLER.

(Total weight of Drawbar and Draw-head, 130 lbs.)

NAMES OF PARTS OF
ARCHER COUPLER; Figs.
412-414.

- A. Draw-head.
- B. Hook Drawbar.
- D. Uncoupling-gap.
- F. } Follower-plates.
- G. }
- H. Draw-spring.
- a. Drawbar Lugs.
- c. Drawbar Spring.
- d. Drawbar Lug-grooves.
- ℓ. Drawbar Rivet-stop.



Fig. 420.
Isometric View

JANNEY FREIGHT-CAR COUPLER.
(Janney and Janney-Miller Passenger Car-couplers, shown in Figs. 542-635.)

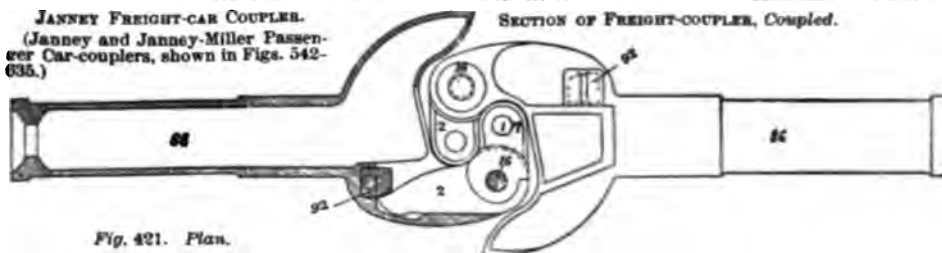


Fig. 421. Plan.

SECTION OF FREIGHT-COUPLER, Coupled.

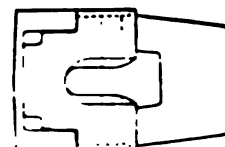


Fig. 422. End View of Coupler



Fig. 423. Perspective View.

NAMES OF PARTS OF JANNEY FREIGHT-CAR COUPLER; Figs. 420-423.

- 2. Janney Knuckle.
- 16. Janney Knuckle-pin.
- 17. Janney Coupling-pin.

- 27. Janney Centre Buffer-spring.
- 31. Janney Draft-washer.
- 86. Freight Coupler.*

- 89. Freight Draft-bolt.*
- 92. Freight Coupler-pin.*
- 95. Freight Main Draft-spring.*
- 96. Freight Buffer-spring.
- 104. Freight Lever Fulcrum-plate
- 105. Freight Lever.
- 106. Freight Lever-catch.
- 107. Freight Lever-plate.
- 117. Freight Buffer-washer.
- 119. Freight Follower.
- 120. Freight Draft-iron.
- 121. Freight Buffer-spring Plate.
- 122. Freight Buffer.
- 123. Freight Chafing-plate.
- 124. Freight Stirrup.
- 125. Freight Face-plate.
- 126. Drop-pin Link.

* Shown separately in Figs. 692-824.

(The reference numbers are the same as used in the makers' lists.)

CAR-BODY DETAILS, Draw-gear ; Freight, Continuous.

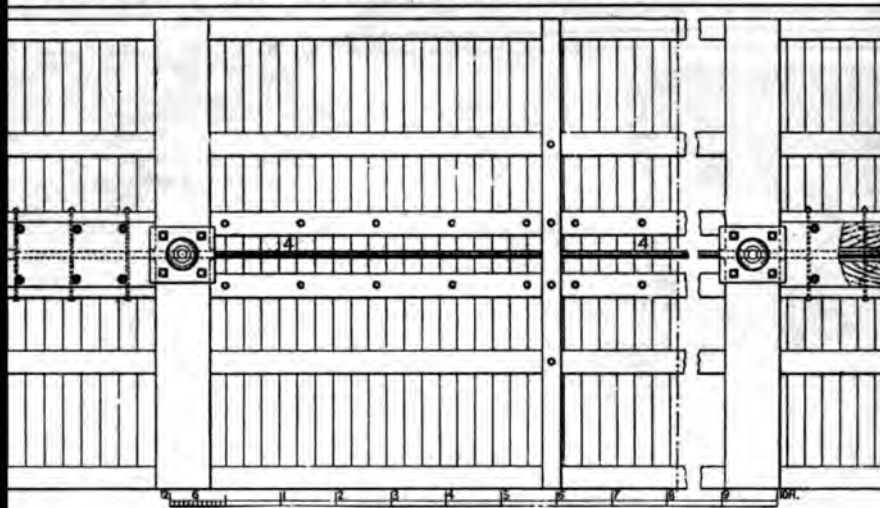


Fig. 424. Inverted Plan.

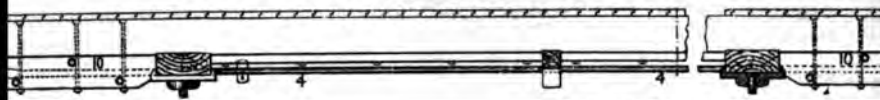




Fig. 428.
Side Elevation.

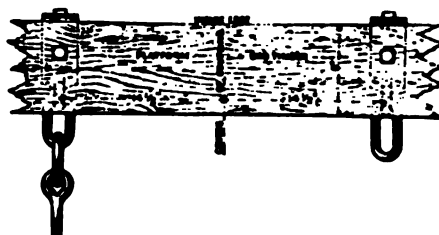
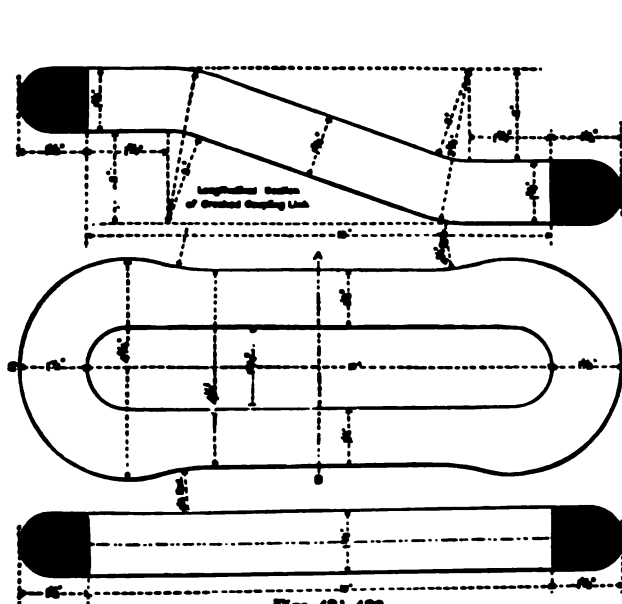


Fig. 429.
Elevation of Platform End-timber.



Fig. 430.
Side Elevation.

SAFETY COUPLING-CHAIN ATTACHMENT FOR PASSENGER CARS, NEW YORK CENTRAL & HUDSON RIVER RAILROAD AND ALLIED LINES.



Figs. 431-433.
Plan and Longitudinal Sections of Coupling-link.



Fig. 434.
Section of Eye on E F.

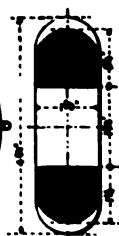


Fig. 435.
Transverse Section on A B.

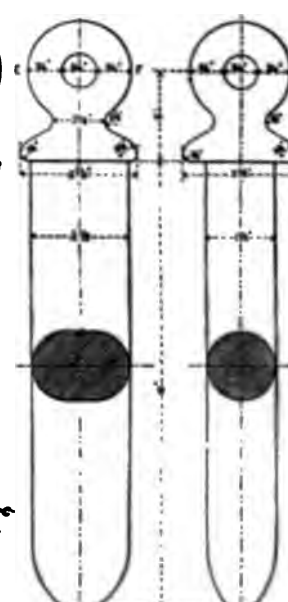


Fig. 436. FLAT EYE-HEAD COUPLING-PIN.
Fig. 437. ROUND EYE-HEAD COUPLING-PIN.

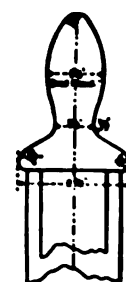


Fig. 438.
SOLID-HEAD COUPLING-PIN.



Fig. 439.
BRIDGE'S COUPLING-LINK.

STANDARD COUPLING LINKS AND PINS, NEW YORK CENTRAL & HUDSON RIVER RAILROAD AND ALLIED LINES.

(Scale, $\frac{1}{8}$ full size.)

AR-BODY DETAILS, Draw-gear, Freight; Drawbars, Links and Pins.



links or
q-link.



Fig. 447.
SIDE-CASTING.
(see Fig. 401-404.)



Fig. 441.
COUPLING-LINK.
(Common form; see Figs. 432-3 for
improved form.)



Fig. 442.
CROOKED COUPLING-LINK.
(Common form; see Figs. 431-2 for
improved form.)



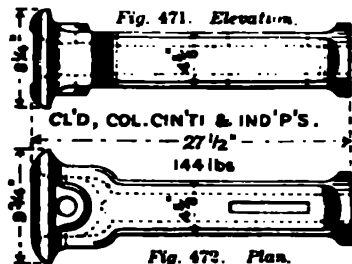
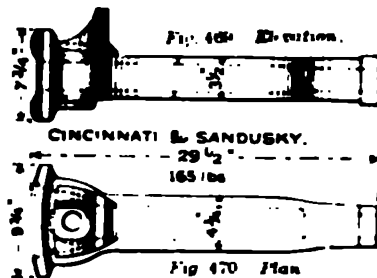
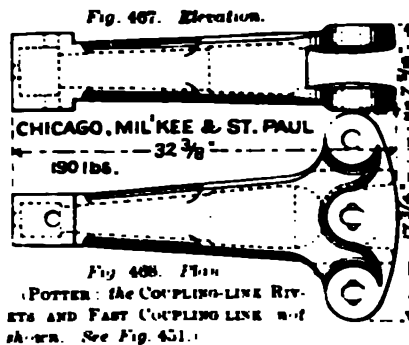
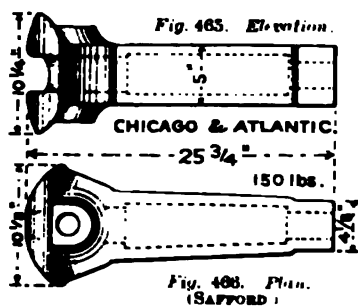
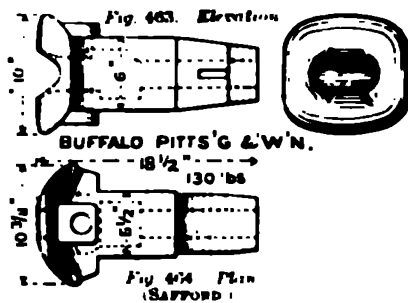
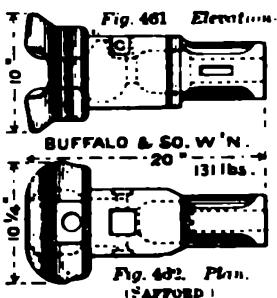
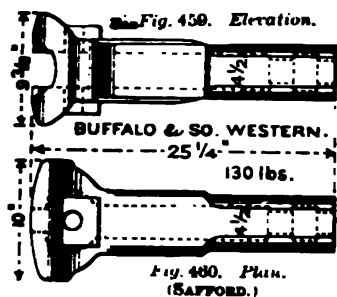
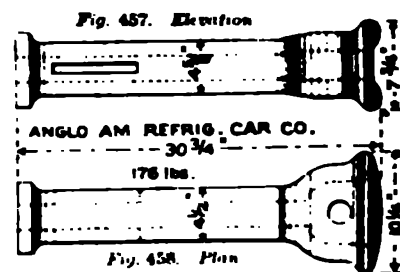
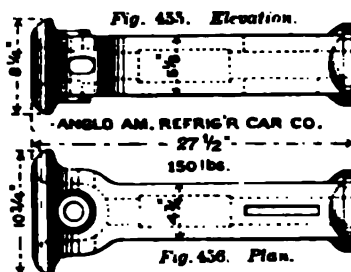
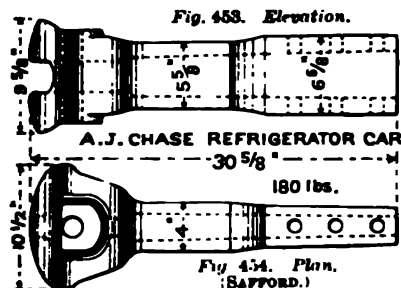
Fig. 443.
SOLID-HEAD
COUPLING-PIN.



Fig. 445. EYE-HEAD,
COUPLING



Fig. 448.
SAFFORD DRAWBAR.
3. Drawbar Head. 7. Drawbar Bo



STANDARD CAST-IRON DRAWBARS

(The 42 drawbars shown on this and the three following pages are those carried in stock for repairing purposes on the New York, Lake Erie & Western Railroad, and include nearly all the leading types.)

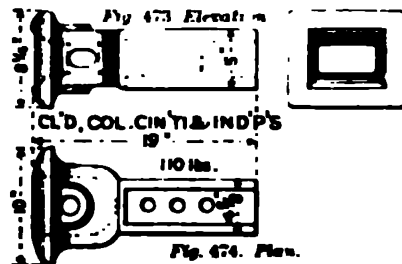
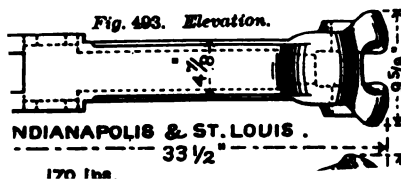
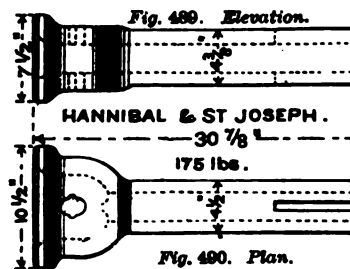
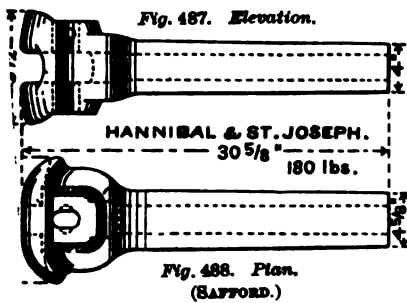
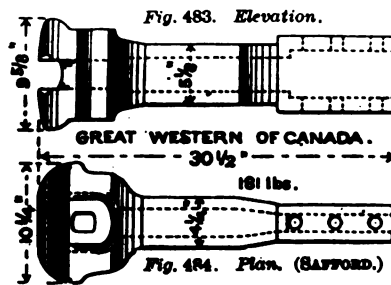
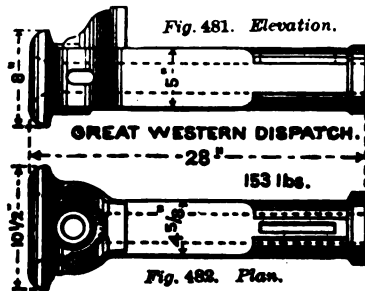
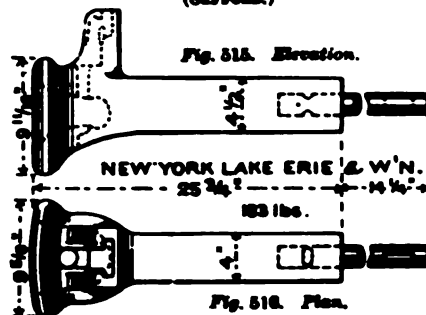
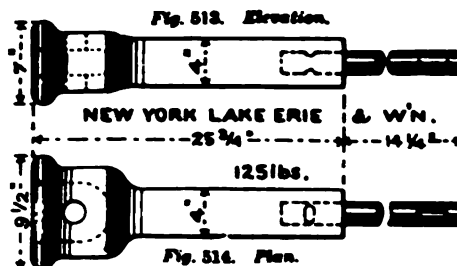
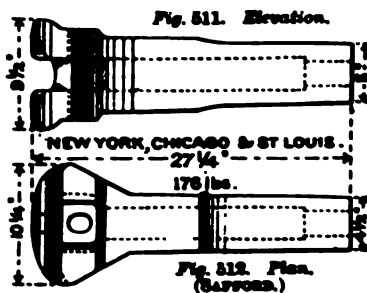
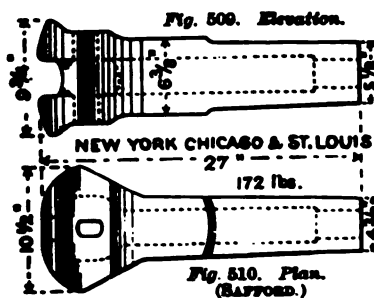
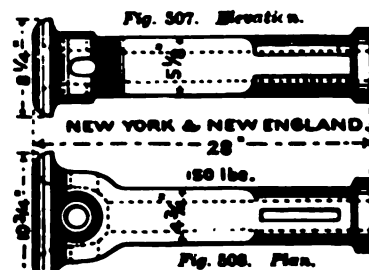
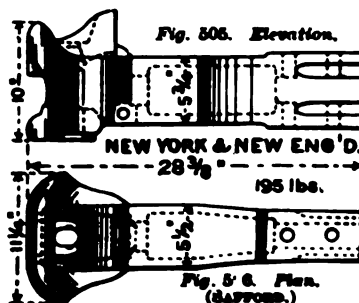
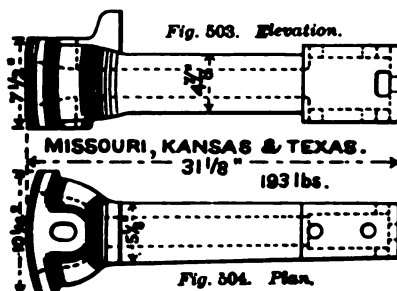
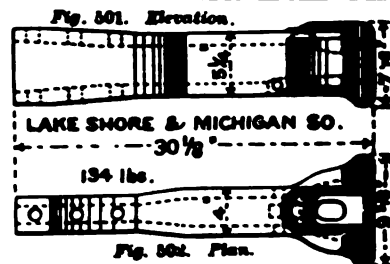
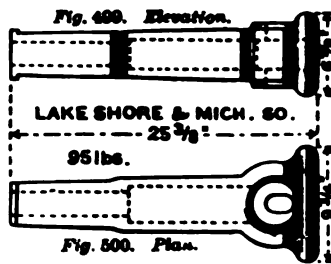
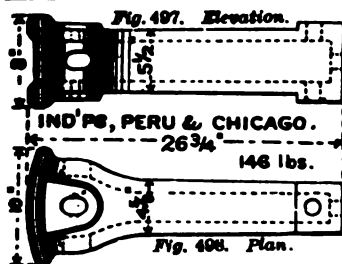


Fig. 478. Plan.



STANDARD CAST-IRON DRAWBARS.—See note on preceding page.

Figs. 489, 477, 481, 505 and 527 show DRAWBAR SAFETY-LOGS. The bottom...



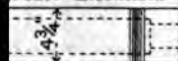
STANDARD CAST-IRON
DRAW-BARS.

(See notes on two preceding pages.)

Garford Automatic; See Figs. 416-417.

CAR-BODY DETAILS; Draw-gear, Freight; Drawbars.

Fig. 517. Elevation.



LAKE ERIE & W.N.

25 3/4

132 lbs.

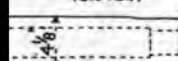
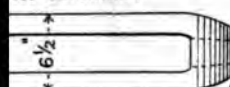


Fig. 518. Plan.

Fig. 523. Elevation.



PHILADELPHIA & READING.

29

57 lbs.

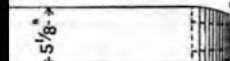
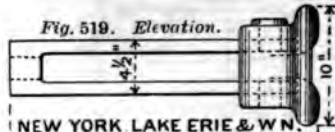


Fig. 524. Plan.

Fig. 529. Elevation.

Fig. 519. Elevation.



NEW YORK LAKE ERIE & W.N.

25 3/4

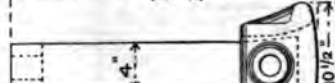
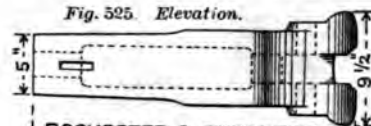


Fig. 520. Plan.

Fig. 525. Elevation.



ROCHESTER & PITTSBURG.

183 lbs.

27 1/4



Fig. 526. Plan.
(SAFFORD.)

Fig. 531. Elevation.

Fig. 521.



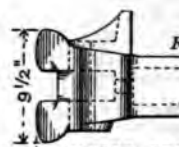
NEW YORK P.A.

20 1/8

119 lbs.



Fig. 522.



UNITED STATES

27 1/4



Fig. 527.

Fig. 528.

Fig. 538.

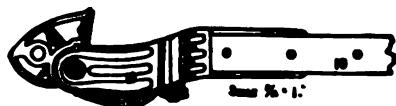
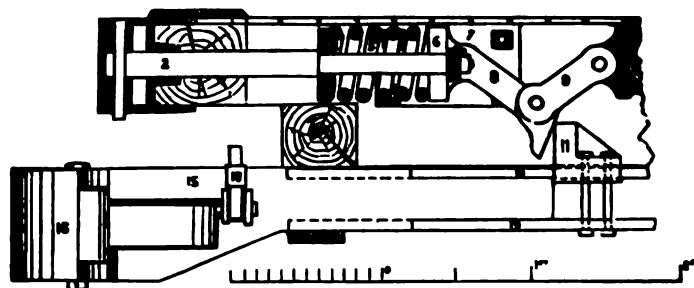


Fig. 539.

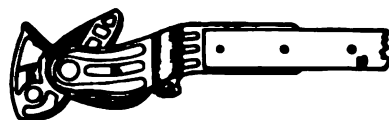


Fig. 540.

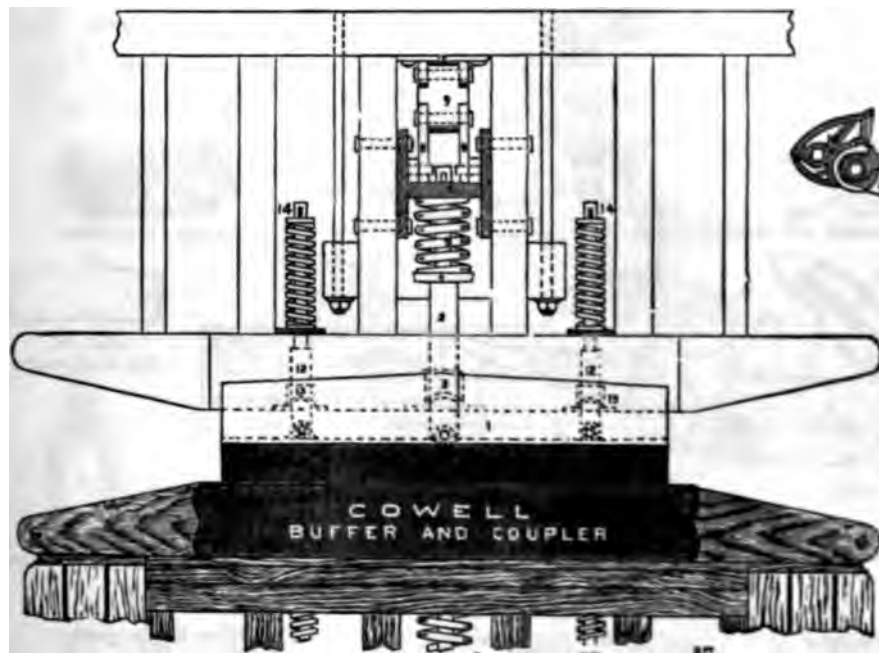


Fig. 537.



Fig. 541.

Figs. 537-541.

COWELL PASSENGER PLATFORM AND COUPLER.
(Freight Coupler shown in Figs. 419-420.)

NAMES OF PARTS OF COWELL COUPLER.

- | | | | |
|-------------------|---------------------|----------------|----------------|
| 1. Buffer-plate. | 6. Follower. | 11. Set-block. | 16. Draw-head. |
| 2. Buffer-stem. | 7. Side-pieces. | 12. Side-arms. | 17. Lock. |
| 3. Buffer-socket. | 8. Knuckle-arms. | 13. Sockets. | 18. Lever. |
| 4. Washer. | 9. Knuckle. | 14. Springs. | 19. Straps. |
| 5. Buffer-spring. | 10. Knuckle-socket. | 15. Draw-bar. | |

CAR BODY DETAILS, Draw-gear, Passenger: Journey.



Fig. 143. Longitudinal Section.
Scorpaeniformes *Platysoma* and *Coryphaena*.

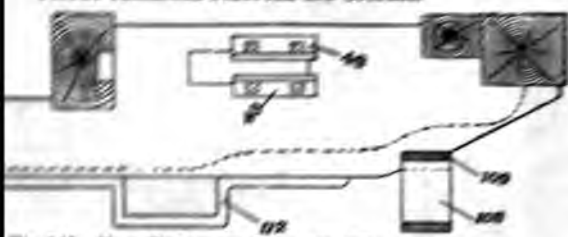


Fig. 649. MALE KNEE-TIMERS AND ATTACHED PANTS.



Fig. 54G



Fig. 5a



Fig. 54C

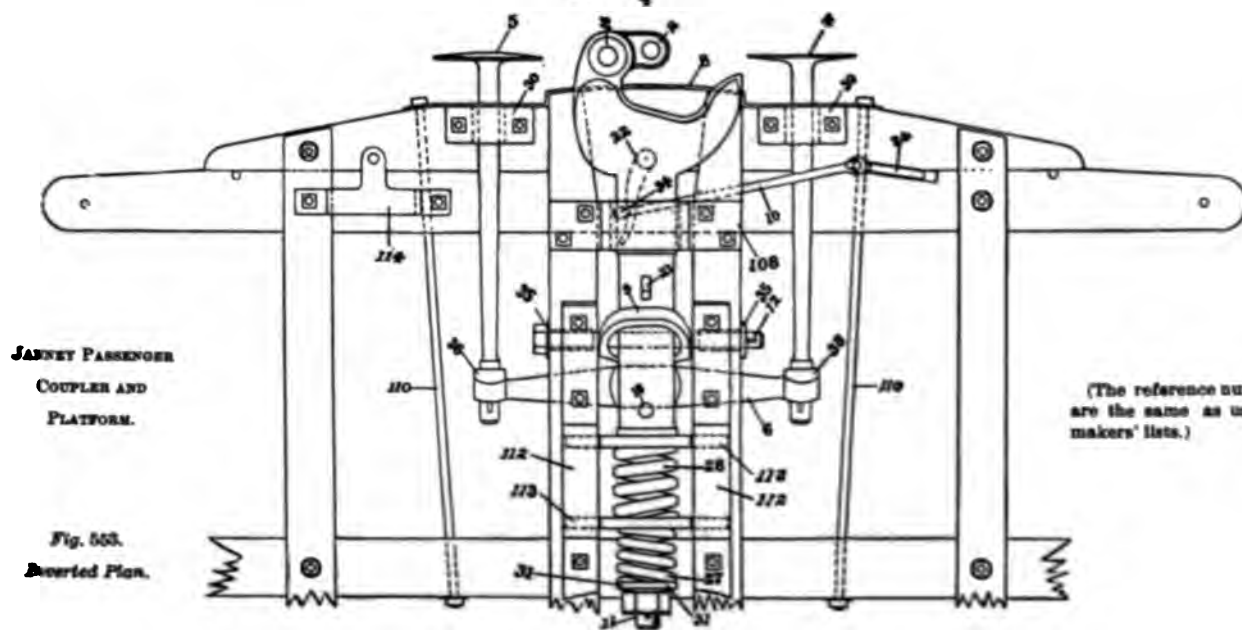
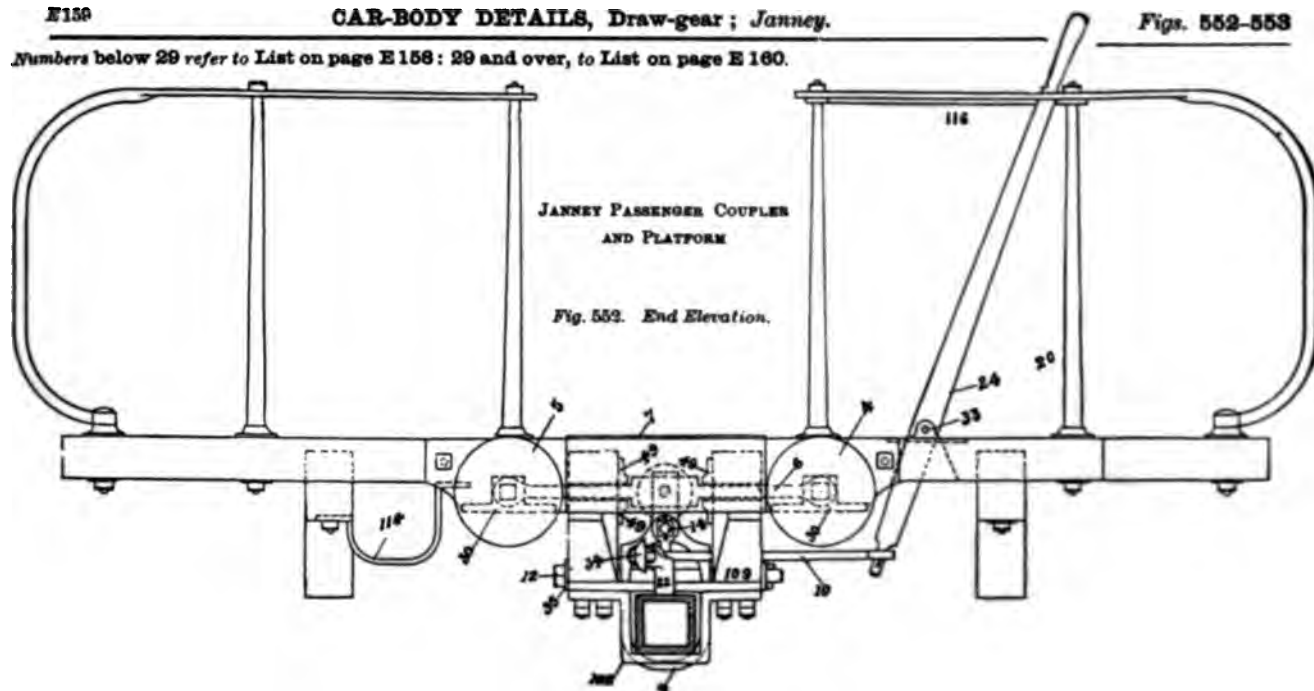


5



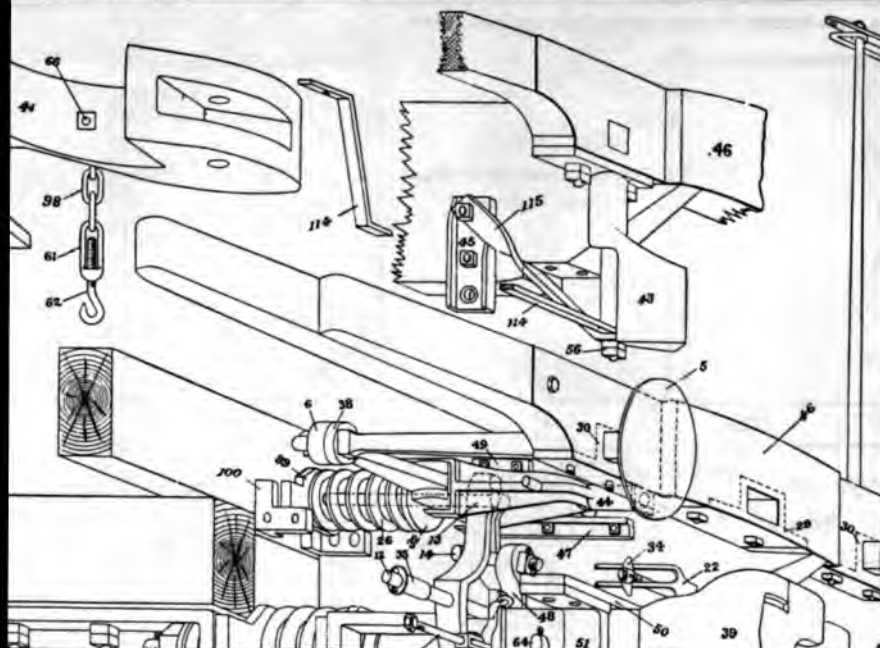
PM

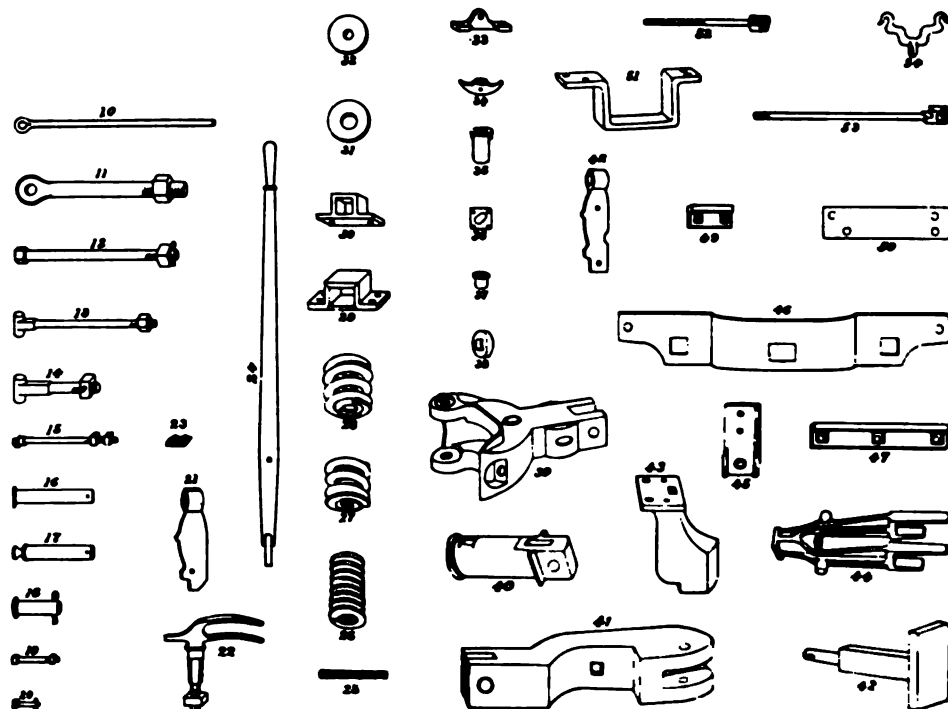
Numbers below 29 refer to List on page E 158; 29 and over, to List on page E 160.



(The reference numbers
are the same as used in
makers' lists.)

CAR-BODY DETAILS, Draw-gear; Janney-Miller.





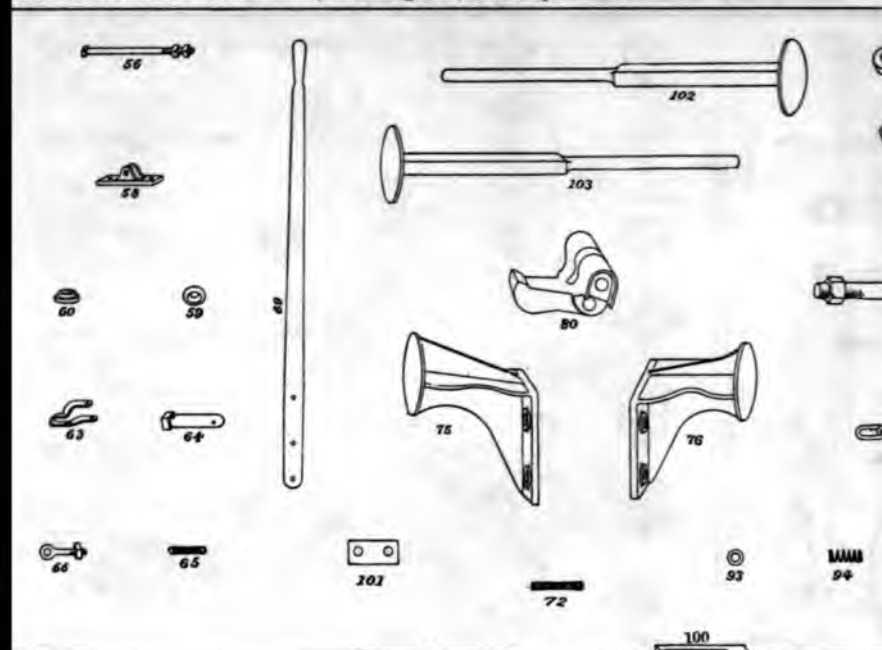
Figs. 555-601. DETAILS OF JANNEY AND JANNEY-MILLER COUPLERS.

NAMES OF PARTS, JANNEY AND JANNEY MILLER DETAILS : Figs. 555-601.

2. Janney Knuckle.	24. Janney Platform Lever.	39. Combination Janney Head.
3. " Catch.	25. " Catch-spring.	40. " Janney Barrel.
10. " Pull-rod.	26. " Centre Buffer-spring.	41. " Miller Head.
11. " Draft-bolt.	27. " Auxiliary Draft-spring.	42. " Miller Buffer.
12. " Fulcrum-bolt.	28. " Main Draft-spring.	43. " Miller Stop.
13. " Long T-bolt.	29. Miller Buffer-guide.	44. " Miller Buffer-yoke
14. " Short T-bolt.	30. Janney Buffer-guide.	45. " Side-spring Plate.
15. " Catch-spring Bolt.	31. " Draft-washer.	46. " End Face-plate.
16. " Knuckle-pin.	32. " Centre-spring Washer.	46. " Horn.
17. " Coupling-pin.	33. " Platform-lever Jar.	49. " Small Equalizing-guide
18. " Tail-pin.	34. " Pull-rod Button.	50. " Chafing-plate.
19. " Horn-bolt.	35. " Fulcrum-ferrule.	51. " Stirrup.
20. " Platform Lever-pin.	36. " Pull-rod Plate.	52. " Side-spring Bolt.
21. " Horn.	37. " Thimble.	53. " Pull-rod.
22. " Catch-lever.	38. " Buffer-washer.	54. " Side-spring Stirrup.
23. " Half-orol Washer.		

(The reference numbers are the same as used in the makers' lists.)

35. CAR-BODY DETAILS, Draw-gear; *Janney*.



(Draw-gear of the Manhattan Elevated Railroads of New York is shown in Figs. 166-167.)

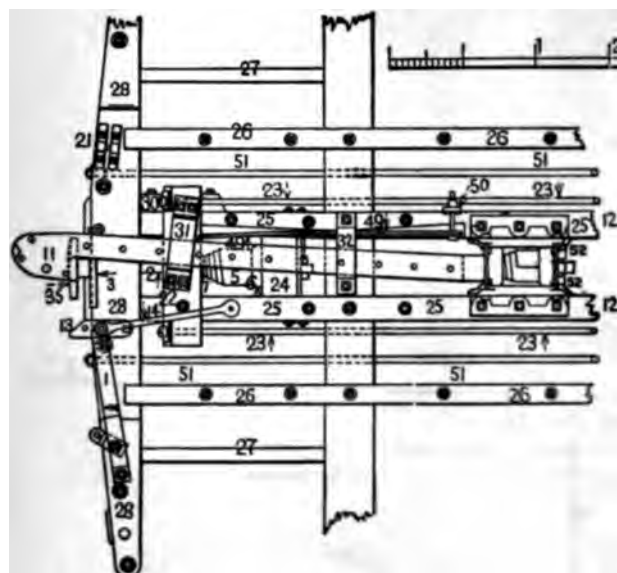


Fig. 636. Inverted Plan.

MILLER COUPLER-BUFFER AND PLATFORM

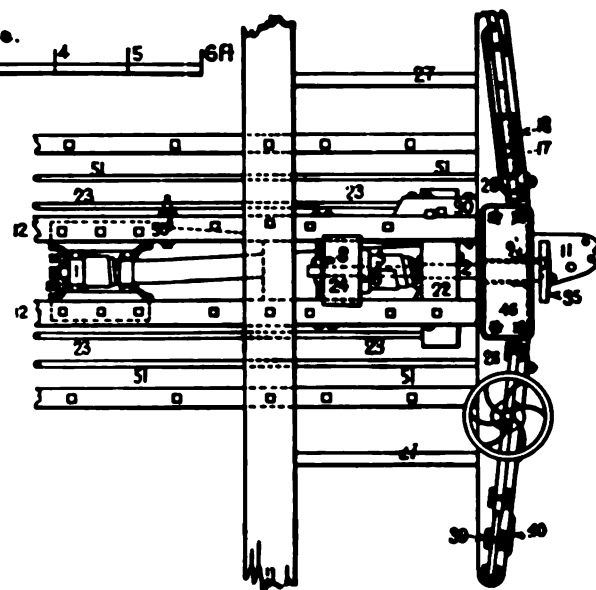


Fig. 637. Plan.

NAMES OF PARTS OF MILLER COUPLER AND PLATFORM ; Figs. 636-643.

- | | | | |
|-----------------------------|-------------------------------|-------------------------------|-------------------------------------|
| 1. Brake-shaft Brace. | 15. Uncoupling-lever. | 26. Platform Timbers. | 40. Coupling-pin Chafing-plate. |
| 2. Buffer-bar. | 16. Uncoupling-chain. | 27. Platform Sills. | 41. Coupling-pin Chain. |
| 3. Buffer-plate. | 17. Uncoupling-lever Ratchet. | 28. Platform End-timber. | 42. Coupling-pin Chain-eye. |
| 5. Buffer-spring. | 18. Uncoupling-lever Plate. | 29. Suspender-beam. | 44. Brake-shaft Thimble. |
| 6. Buffer-spring Cup. | 19. Uncoupling-lever Wedge. | 30. Stirrup-block. | 45. Inscription-plate. |
| 7. Buffer-spring Washer. | 20. Wedge-chain. | 31. Drawbar Carry iron. | 46. Drawbar Chafing-plate. |
| 8. Buffer-stem Washer. | 21. Trunnion-plates. | 32. Inner Drawbar Carry-iron. | 49. Coupling-spring or Leaf-spring. |
| 9. Buffer-thimble. | 22. Platform Truss-beam. | 35. Buffer-head. | 50. Coupling-spring Bracket. |
| 11. Drawbar Coupling-hook. | 23. Platform Truss-rod. | 36. Buffer-shank. | 51. Platform Tie rods. |
| 12. Centre-sills. | 24. Buffer-spring Beam. | 37. Buffer-stem. | 52. Side Lugs. |
| 13. Stop for Coupling-hook. | 25. Drawbar Timber. | 38. Coupling-pin Plate. | |
| 14. Stop-brace. | | | |

3. CAR-BODY DETAILS, Draw-gear; *Miller.*

Numbers refer to List of Names of Parts on preceding page.

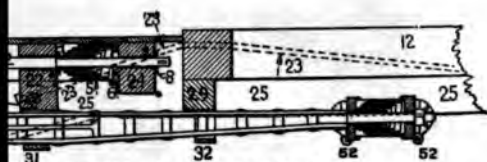


Fig. 638. Longitudinal Section.

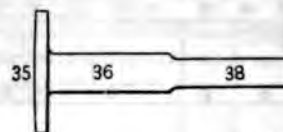


Fig. 63
BUFFER-B



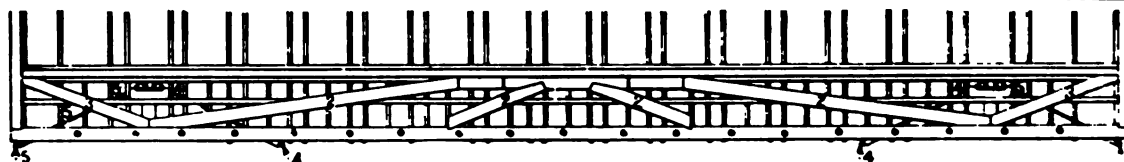


Fig. 644. Side View.

PORTION OF THE SIDE-FRAME OF A PASSENGER CAR, showing—1, COMPRESSION-BEAM; 2, COMPRESSION-BEAM BRACE; 3, COCKER-BRACE; 4, BODY BRACE-ROD; 5, BODY COUNTERBRACE ROD.

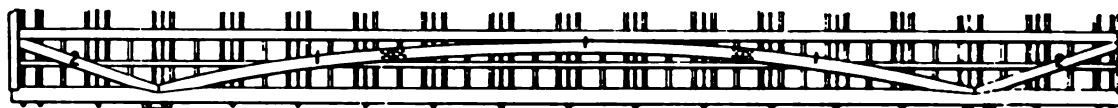


Fig. 645. Side View.

PORTION OF THE SIDE-FRAME OF A PASSENGER CAR, showing—1, TRUSS-ARCH; 2, BODY-COCKERBRACE.

(A different style of this general type of framing is shown with names of parts in Fig. 152; also, without reference numbers, in Fig. 189.)

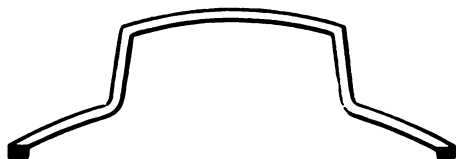


Fig. 646.

PROFILE CARLINE.



Fig. 647

SECTION OF COMPOUND CARLINE.

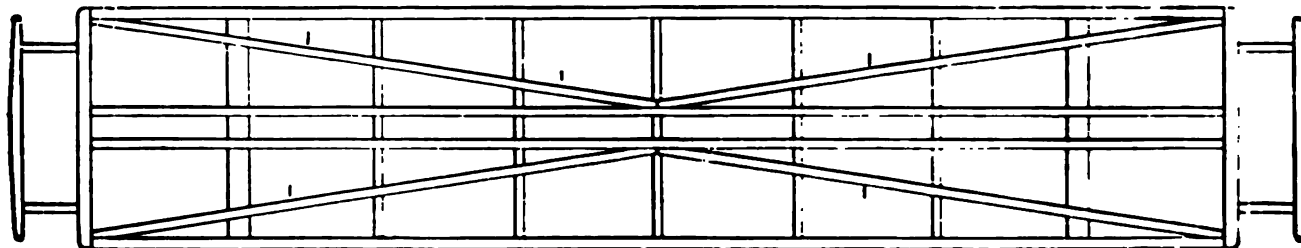


Fig. 648. Plan.

FLOOR FRAMING, showing—1, DIAGONAL FLOOR-TIMBER.

CAR-BODY DETAILS; Framing, etc.

except that the carlines point at the centre of the upper deck." Such a roof (Fig. 649.)

Fig. 649.
CAR ROOF.



Fig. 650.
X CAR ROOF.
Transverse Section.

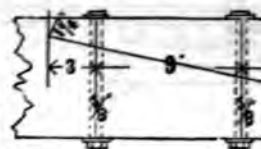


Fig. 651.

SHIP SPLICE OR SILL
Prescribed by Master Car-
the Standard for repairing
following extract from "Ru
Cars;":

"RULE 14.—Sills broken or
be replaced by new ones of th
quality, an exception to be ma
outside sills to which the
attached, which, if broken b
sill only, may be spliced with
shown, of 24 inches in lengt
5/8-inch bolts, all to be done
ner."

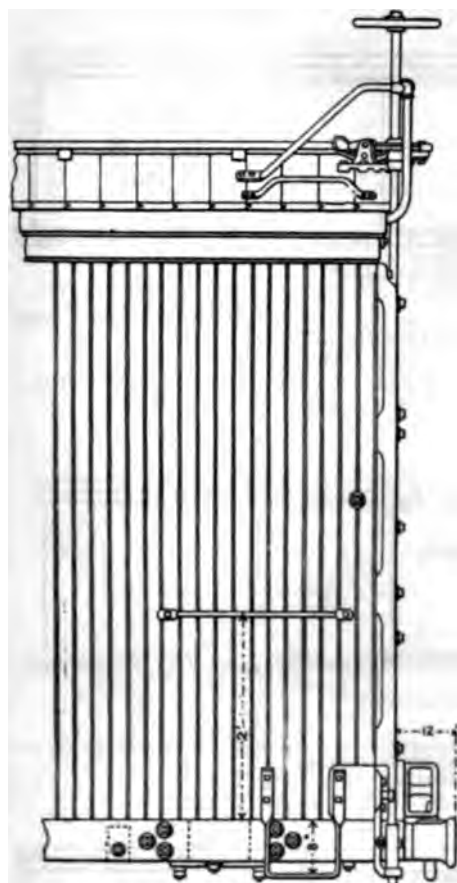


Fig. 656. Side View.

STANDARD (except as noted *) LADDER AND GRAB-IRON ATTACHMENTS recommended by M. C. E. Association, at 13th Annual Convention, Chicago, 1878.

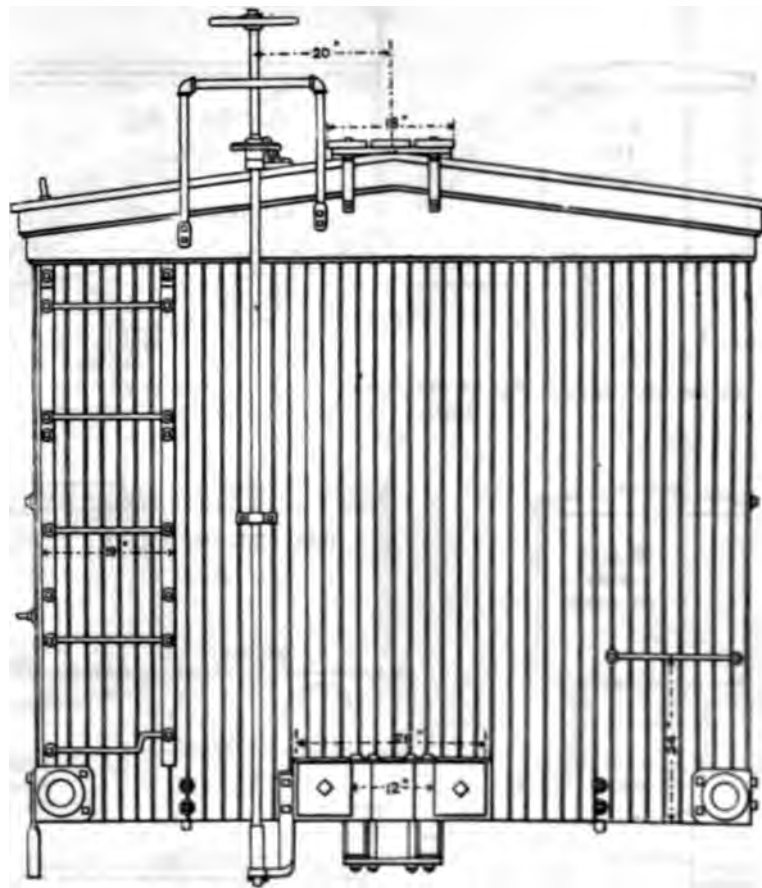


Fig. 657. End View.

- It was specifically recommended,
- (1) "That all brake-shafts be placed on the left-hand corner of the car, when a person is standing on the track facing the end of the car," as in Fig. 657.
 - (2) "That the small platform (brake-step) placed at one end of freight cars, to fasten the brake-pawl, etc. (100, Figs. 82, 84, 132, 136), be discontinued, the ratchet-wheel and pawl to be fastened to a suitable casting on the roof."
 - (3) "That the running-boards be not less than 18 in. wide and 1 in. thick, the ends to project $5\frac{1}{4}$ in. outside of the boarding, the projections to be supported by two braces made of 2 in. by $1\frac{1}{4}$ in. iron."
 - (4) "That two good substantial steps (sill-steps), made of wrought-iron $\frac{1}{2}$ by $1\frac{1}{4}$ in., be fastened, one to each side-sill, at diagonal corners of the car."
 - (5) "That each box and stock car have two ladders, not less than five steps in each ladder, made of $\frac{1}{2}$ -in. round iron, projecting $3\frac{1}{4}$ in. from the siding, securely fastened to each end at diagonal corners, with a handle directly over the ladders, on the roof."
 - (6) "That the lower step of the ladder have a guard or projection in order to prevent men slipping when swinging around the end of the car to get on the step."
- * The grab-irons or handles shown are in the position recommended by a committee whose report was "received," but no other action was taken; also, the dimensions given in Fig. 657 for distance apart of end-blocks have been increased 3 in. each. See Fig. 617.

663. CAR-BODY DETAILS; Lettering.

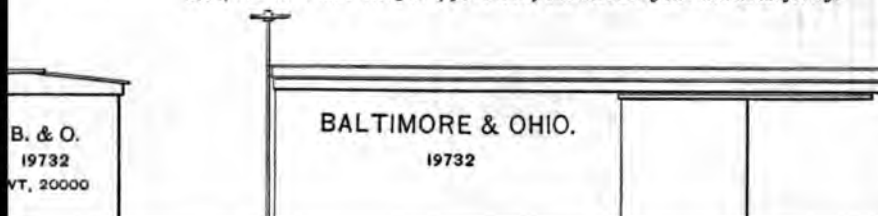


658.

CARS IN FAST FREIGHT LINE SERVICE

Fig. 659 M. C. B. STANDARD LETTERING.

Following plans, Figs. 660-663, for lettering cars in ordinary service were submitted to letter-ballot, pursuant to the provisions of the Act of March 3, 1884, and were **not adopted**, for lack of the necessary two-thirds majority.



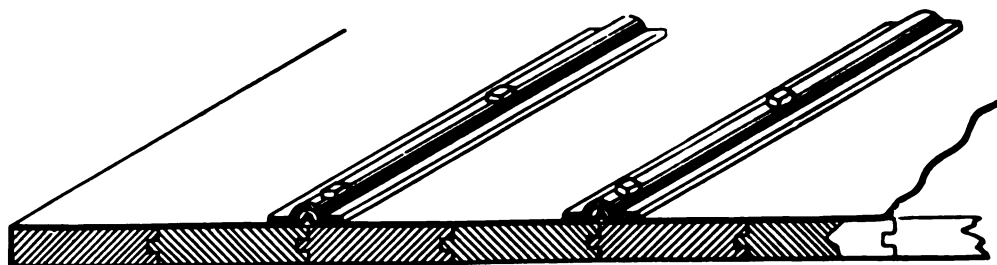


Fig. 664. SINGLE-BOARD CAR ROOF.

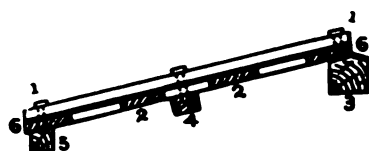


Fig. 665. Section.

SINGLE-BOARD CAR ROOF.

1. Roof Cover-strip.
2. Roof-sheets.
3. Ridge-pole.

4. Purlin.
5. Plate.
6. Roof-boards.

(Several other varieties of roofs, not shown by illustrations, consist of one or two thicknesses of boards, with or without some form of dove-tail connection, with painted canvas, or other similar water-proofing material. See CAR-ROOF in Dictionary.)



Fig. 666. Section.

DOUBLE-BOARD CAR ROOF.

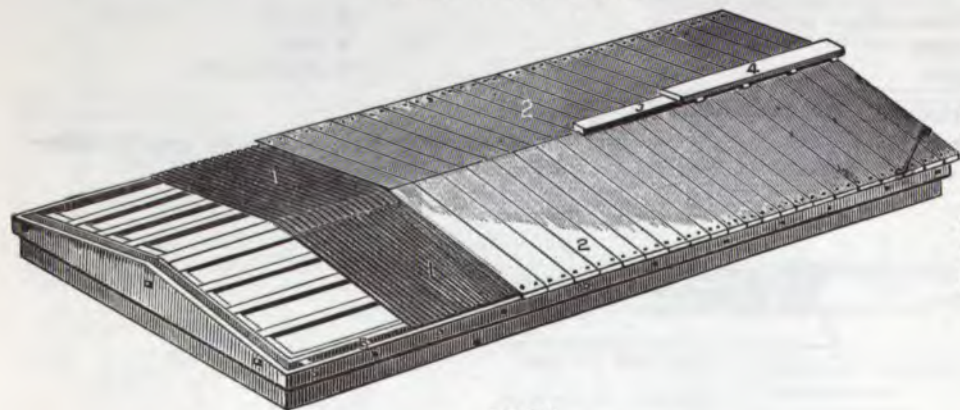
Figs. 667-669. CAR-BODY DETAILS, Roofs; Empire Roof.



*Fig. 667.
End Section of Roof.*



*Fig. 668.
Skeleton View of Roof Frame.*



NAMES

1. Roof Me
2. Roof
3. Ridge
4. Run
5. Over

*Fig. 669.
EMPIRE CORRUGATED-METAL CAR ROOF*

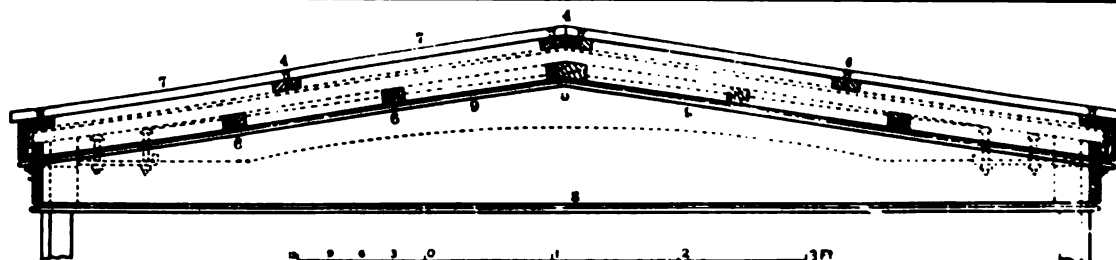


Fig. 670. Transverse Section

NAMES OF PARTS; Figs. 670-672½.

1. Joint-strip.
2. Corrugations.
3. Cover-strip.
4. Roof-strips.
5. Ridge-pole.
6. Purlins.
7. Roof-boards.
8. Eaves Fascia-board.
9. Curline.

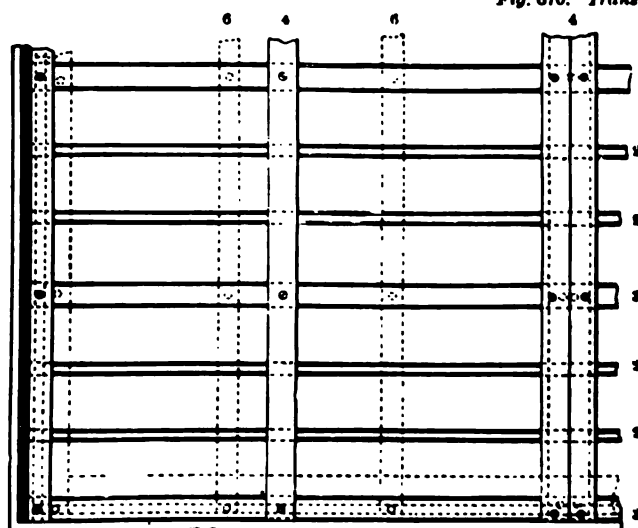


Fig. 671. Plan.

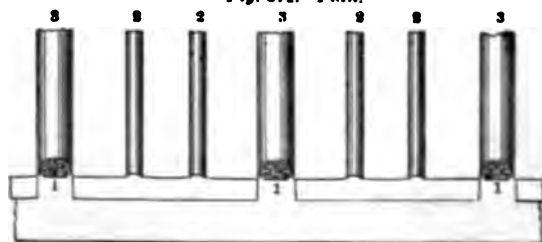


Fig. 672 Longitudinal Section.

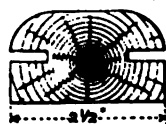


Fig. 672½. SECTION OF JOINT STRIP.

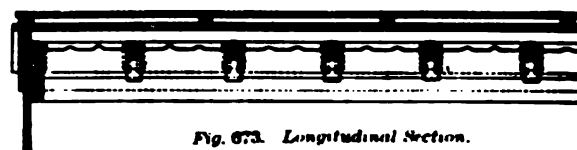


Fig. 673. Longitudinal Section.

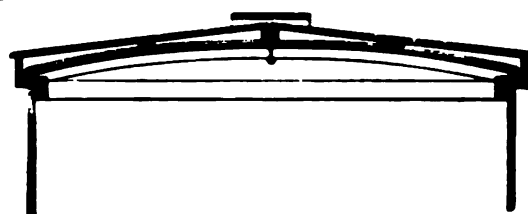


Fig. 674. Transverse Section.

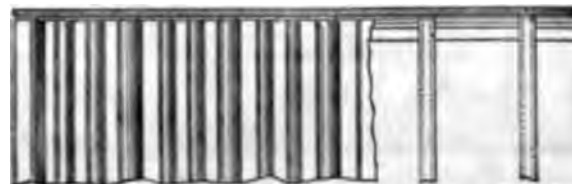


Fig. 675. Plan.

WINSLOW CAR-ROOF. (With curved roof-sheets.)

WINSLOW CAR-ROOF.

(With flat roof-sheets; the most recent and common standard.)

4. *Berth-brace.*
5. *Berth-brace Eye.*
6. *Berth-chain.*
7. *Berth-chain Pulley.*
8. *Berth-spring.*
9. *Berth-spring Frame.*
10. *Berth-spring Rope.*

13. *Berth-curtain.*
14. *Berth Curtain-rod.*
15. *Berth Curtain-rod Bracket.*
16. *Head-board.*
17. *Head-board Bolt.*
18. *Hat-post.*

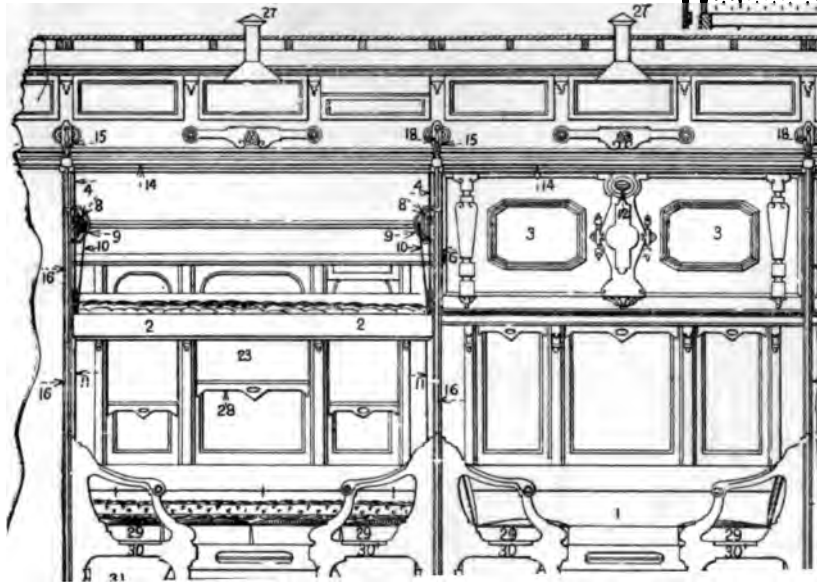
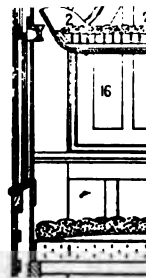




Fig. 678.

PERSPECTIVE VIEW OF SECTION OF A SLEEPING-CAR.

(Names of Parts on previous page.)

NAMES OF PARTS; Fig. 679.

- 3. Upper Berth, folded up.
- 13. Berth-curtain.
- 14. Berth Curtain-rod.
- 21. Bar Sash-lift.
- 27. Window-shade Leather.
- 30. Right-hand Seat-end.
- 30'. Left-hand Seat-end.
- 40. Table.
- 49. Berth Safety-latch Handle.

NOTE.—Figs. 678-679 do not correctly represent the more modern style of interior finish, the general style of which is more correctly shown in Fig. 678. The triple windows of Fig. 677 are now unusual, preference being given to the arrangement shown in Figs. 678-9, except that the buffet or sideboard and looped curtains are special to private cars. The BERTH-SPRINGS, B, is now often concealed behind boarding at the side of the car and the BERTH SAFETY-ROPS dispensed with by use of BERTH SAFETY-LATCHES, Figs. 1261-1264.

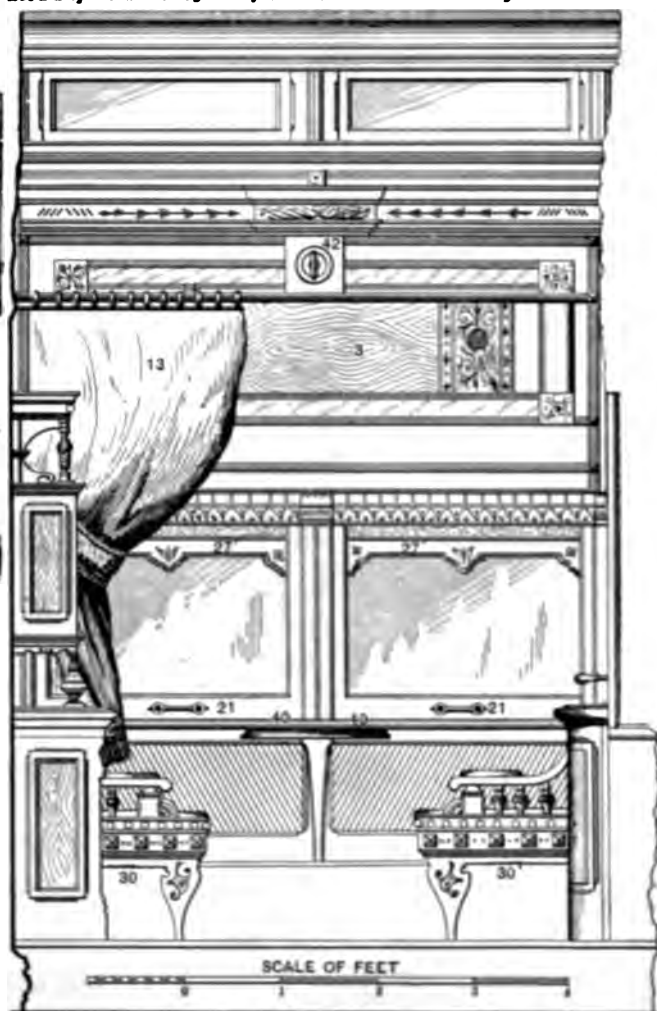
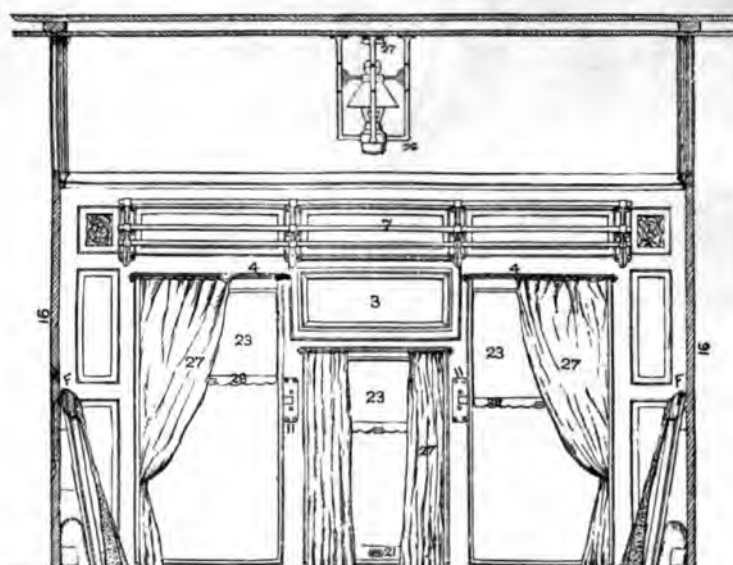


Fig. 679.

SLEEPING-CAR BERTH for private car of PITTSBURGH, CLEVELAND & TOLEDO RAILROAD. ("QUEEN ANNE" style of interior finish.)

(Floor-plan of car shown in Fig. 211.)

R-BODY DETAILS, Sleeping Berths; Mann "Boudoirs."



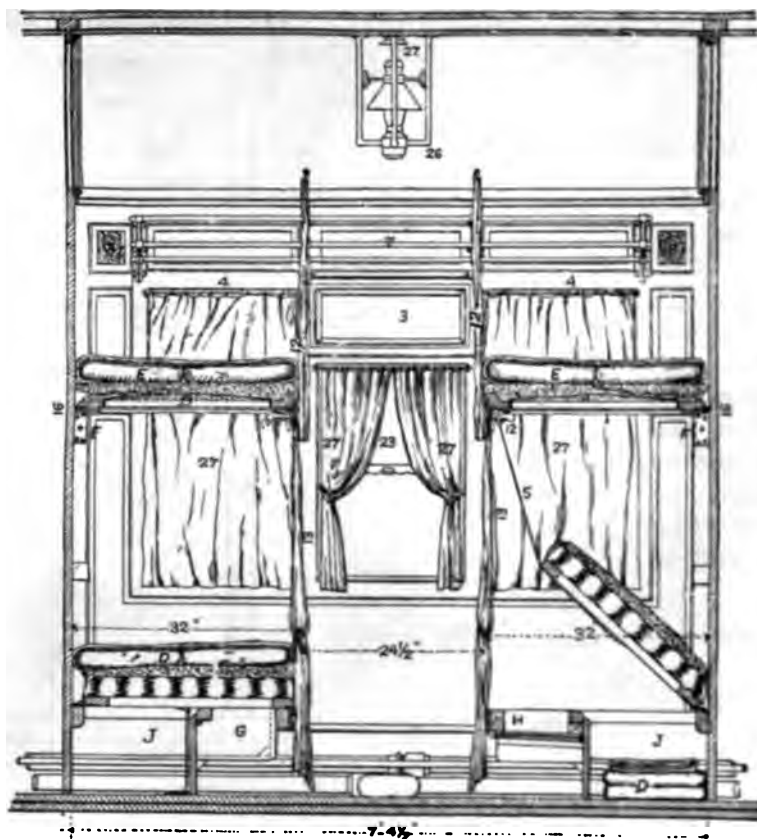


Fig. 681.

Sectional view of a FOUR-PLACE BOUDOIR in process of conversion into a sleeping room.
MANN BOUDOIR SLEEPING CAR.

NAMES OF PARTS OF MANN BOUDOIR SLEEPING BERTHS : Figs. 680-681.

- | | | |
|-------------------------------|---|--|
| A. Sofa. | 3. Mirror-panel. | 14. Upper Berth-rest. |
| B. Sofa-back and Upper Berth. | 4. Curtain-rods. | 16. Partition-wall. |
| C. Bolsters. | 5. Seat-cord. | 21. Sash Lift. |
| D. Lower-berth Mattress. | 7. Basket Rack, with Exhaust Ventilators at each end. | 23. Window Shades. |
| E. Upper-berth Mattress. | 11. Upper Berth-rest Plate. | 26. Lamp Arms. |
| F. Upper Berth-hinge. | 12. Upper Berth-rest and Upper Berth-curtains. | 27. Smoke-bell for Lamp. |
| G. Pillow-box. | 13. Lower Berth-curtains. | 27. Window Curtains (Side and Centre). |
| H. Step-ladder Box. | | 28. Window-shade Leathers. |
| J. Mattress box. | | |

- B.** *Seat-back Corner.*
- H.** *Berth-catch.*
- K.** *Berth-rest Plate.*
- L.** *Upper Berth-rest.*
- M.** *Berth-rest (double).*
- N.** *Single or End Berth-rest.*
- O.** *Stop-bar.*
- R.** *Stop-bar Hinge.*
- S.** *Stop-bar Plate.*

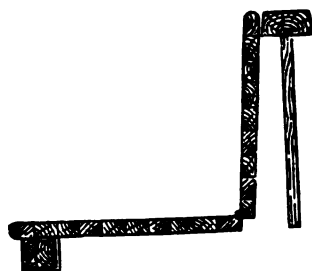
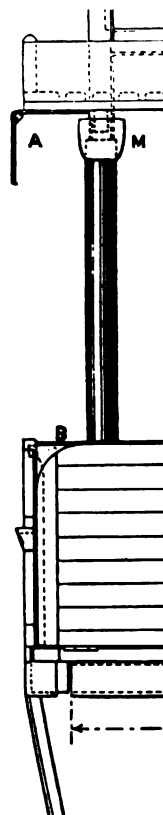
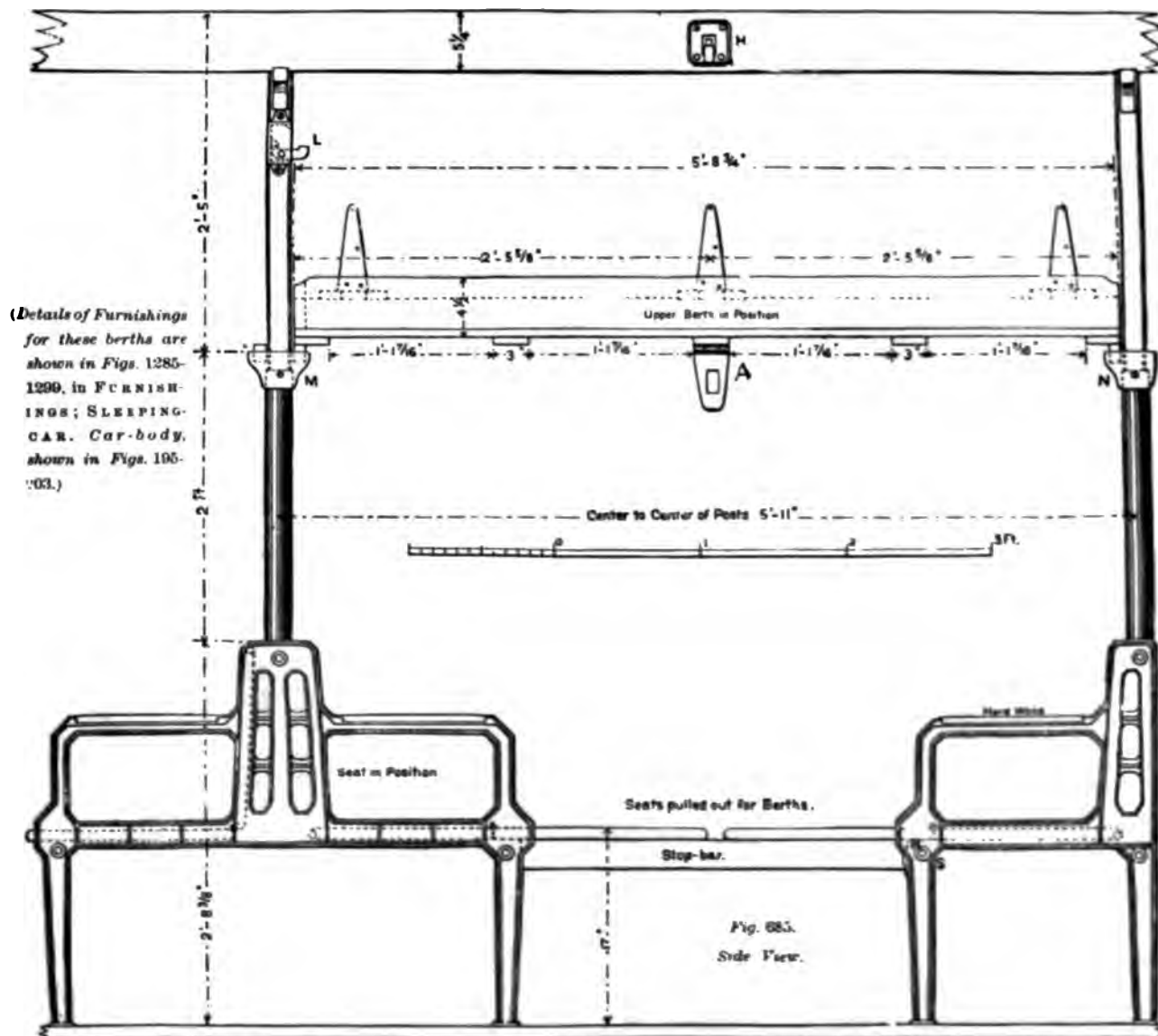


Fig. 682. Section of Seat, at O P, Fig. 684.



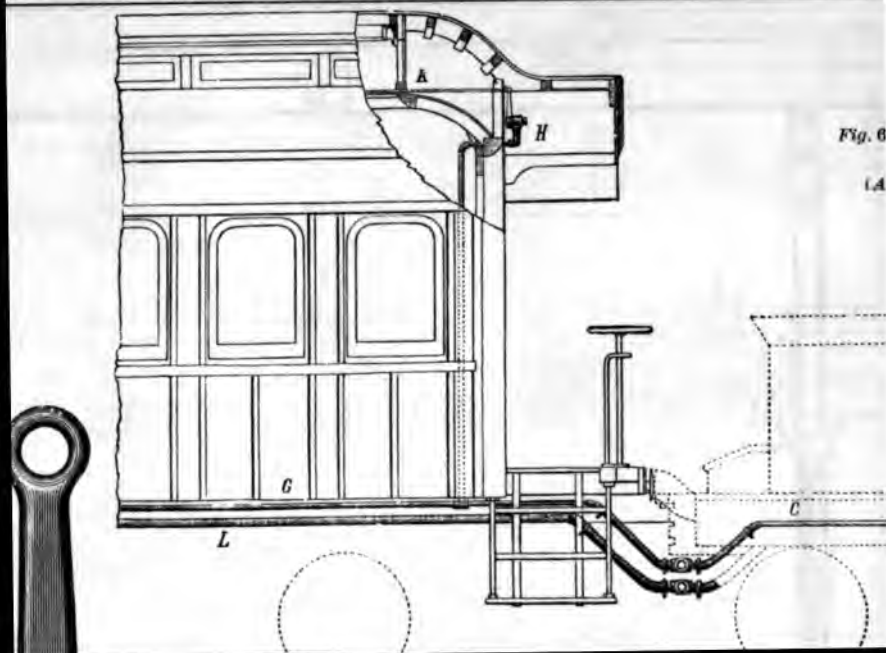
Top View of Position of Bar when not in use.

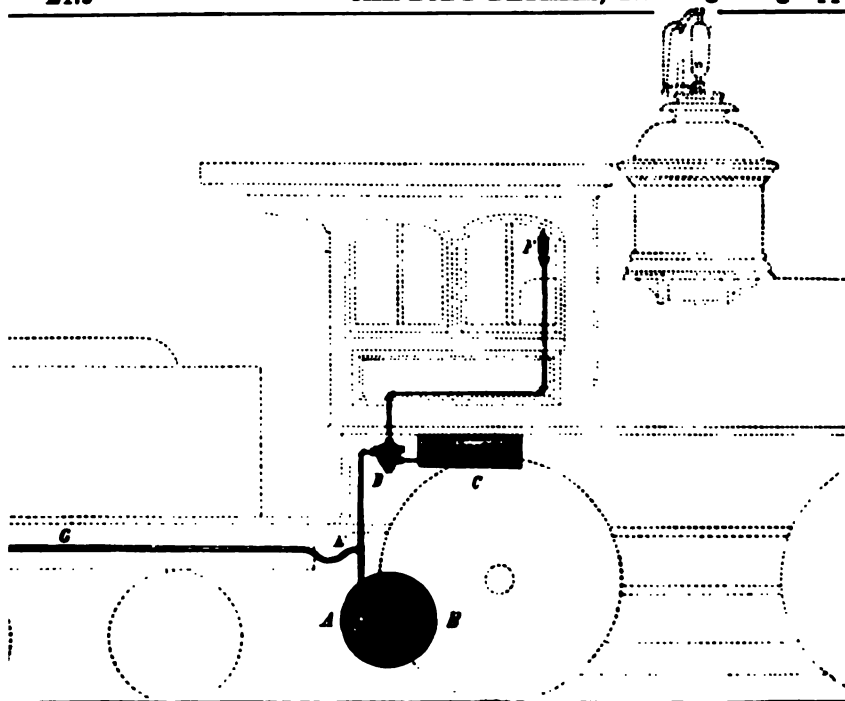




SLEEPING BERTH FOR EMIGRANT CAR, UNION PACIFIC RAILROAD.

CAR-BODY DETAILS; Steps. (See page E 180.)





NAMES OF PARTS IN GENERAL VIEW
Fig. 687.

- A. Reducing Valve.
- B. Main Reservoir.
- C. Signal Reservoir.
- D. Signal Valve.
- E. Signal-pipe Coupling.
- F. Signal Whistle.
- G. Signal-pipe.
- H. Car Signal-valve.
- K. Signal or Bell-cord.
- L. Brake-pipe.

NAMES OF PARTS; Fig. 690.

- 2. Lower Diaphragm-case.
- 3. Upper Diaphragm-case.
- 4. Lower cap Nut.
- 5. Valve and Valve-stem.
- 6. Feed-valve.
- 7. Feed-valve Nut.
- 8. Upper Diaphragm-plate.
- 9. Lower Diaphragm-plate.
- 10. Diaphragm.
- 11. Rubber Gasket.
- 12. Diaphragm Spring.
- 13. Eye-bolt.
- 14. Eye-bolt Nut.

(The reference numbers are the same as used in the makers' lists.)

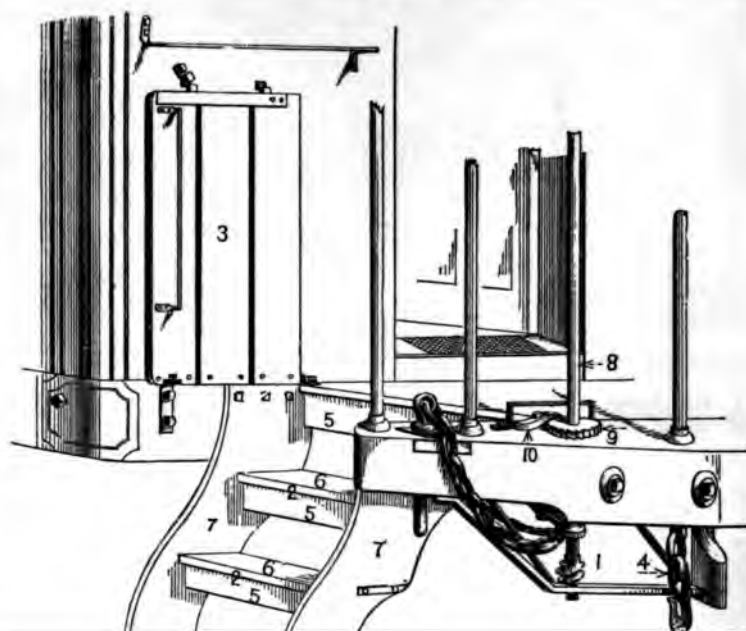


Fig. 691. REDUCING-VALVE.

NAMES OF PARTS; Fig. 691.

- 2. Reducing-valve Body.
- 3. Upper Cup.
- 4. Lower Cup.
- 5. Supply-valve.
- 6. Diaphragm-plate.
- 7. Diaphragm.
- 8. Diaphragm Nut.
- 9. Diaphragm Spring.
- 10. Supply-valve Spring.

CAR-BODY DETAILS, Train Signaling App's. (See preceding page.)



CAR WINDOWS.

NOTE.—The curved window-mouldings, 8, Fig. 692, and some of the details of Decoration, are not according to the most recent practice. See Fig. 679 and several cars in CAR-BODIES, PASSENGER, for more recent designs. The same is true of the Inside Window-panel, 35, Fig. 694, on the following page, and the Lambrequin, 26; Window-cornice, 34; and Window-shade, 27', in Fig. 695.

The furnishings shown attached in Figs. 693-695 are shown separately in FURNISHINGS; WINDOW, TABLE, SEATS, etc.

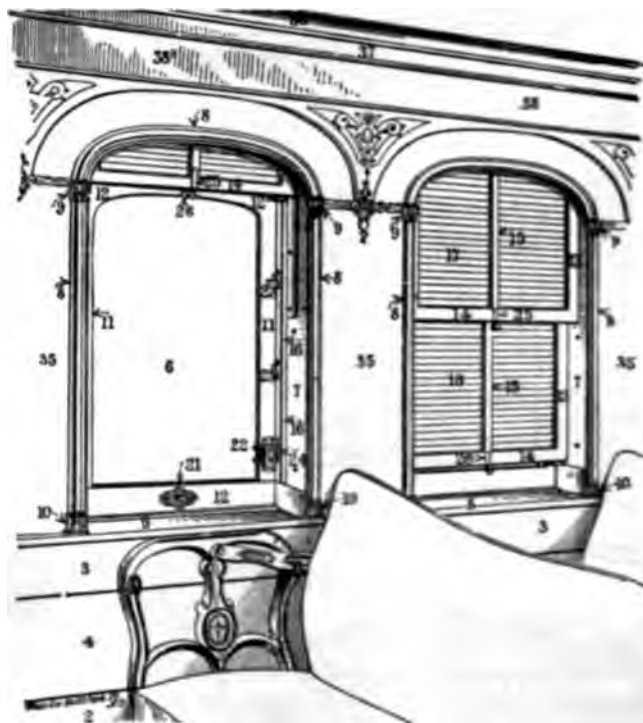


Fig. 692.

PERSPECTIVE VIEW OF PASSENGER-CAR WINDOWS.

NAMES OF PARTS OF CAR WINDOWS; Fig. 692.

- | | |
|---|--|
| 3. Upper Wainscot-rail. | 17. Upper Window-blind, and Window-blind Slat. |
| 4. Wainscot-panel. | 18. Lower Window-blind. |
| 5. Inside Window-sill. | 19. Window-blind Stop. |
| 6. Window, or Window-glass. | 21. Window-lift. |
| 7. Window-casing, or Inside Window-stop. | 22. Window-latch. |
| 8. Window-moulding. | 23. Window-latch Upper-stop. |
| 9. Window-moulding-joint Cover. | 24. Window-latch Lower-stop. |
| 10. Window-moulding Base. | 25. Upper Window-blind Lift. |
| 11. Window-stile. | 26. Lower Window-blind Lift. |
| 12. Window-rail, Window-sash. | 27. Inside Window-panel. |
| 13. Window-blind Stile. | 28. Inside cornice. |
| 14. Window-blind Rail. | 29. Inside cornice Fascia-board. |
| 15. Window-blind Mullion. | 30. Inside cornice Sub-fascia-board. |
| 16. Sash Parting-strip, Parting-head, or Sash-head. | |

Figs. 694-695. CAR-BODY DETAILS; Windows.

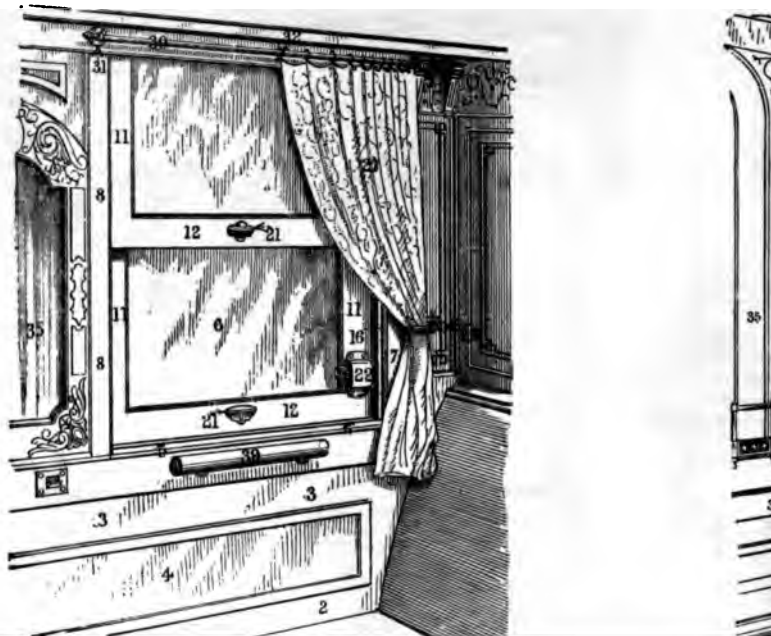




Fig. 696.

BASKET-RACK (old style).

1. Basket-rack Bracket.
2. Basket-rack Netting.
3. Basket-rack Rod.
4. Basket-rack T p. or Acorn.

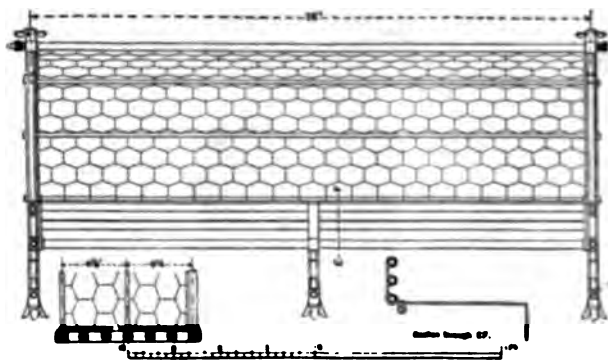


Fig. 697. Front Elevation, etc.

Fig. 697½. End Elevation.

BASKET RACK, for Pennsylvania Railroad Standard Passenger Car.

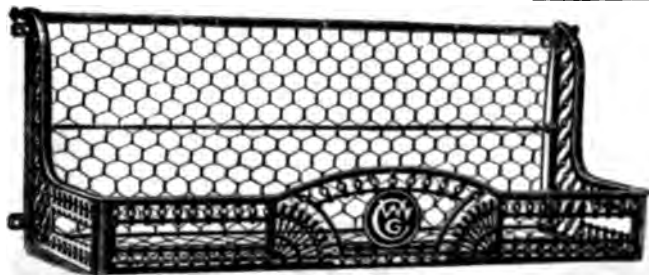


Fig. 698.

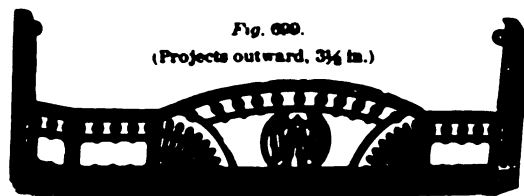
"MARLBOROUGH" BASKET-RACK, with Balustrade and brass netting
(24 in. long).

Fig. 699.

(Projects outward, 3¼ in.)

PACKAGE-RACK for drawing-room cars.

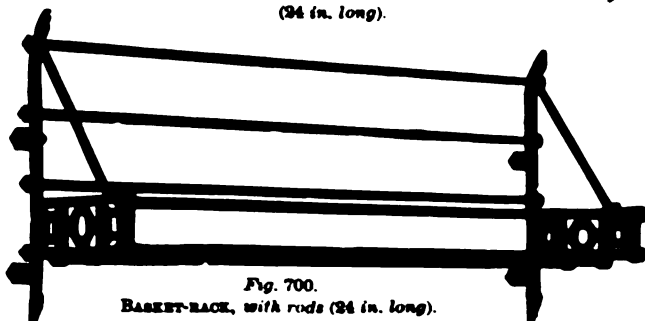


Fig. 700.

BASKET-RACK, with rods (24 in. long).

(Another style of BASKET-RACK of extra length, peculiar to the Mann Boudoir Cars, is shown in Figs 690-691; also, a novel form of special design in the frontispiece to this volume.)

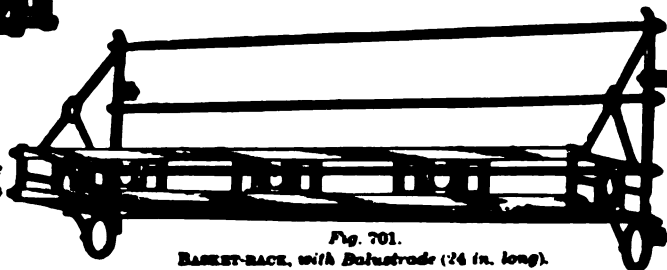


Fig. 701.

BASKET-RACK, with Balustrade (24 in. long).

Fig. 702. BELL-CORD BUSHING.



Fig. 703. BELL-CORD BUSHING, with Internal Pulley.



Fig. 704. BELL-CORD BUSHING, with Pulley.



Fig. 705. QUARTETTE BELL-CORD BUSHING.



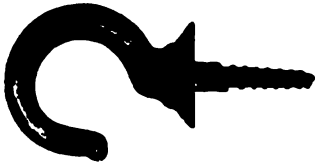


Fig. 715. BELL-CORD END-HOOK



Fig. 717
BELL-CORD GUIDE,
with Screw.



Fig. 718.
BELL-CORD GUIDE, with Flange.



Fig. 719.
BELL-CORD SCREWER.



Fig. 716. FREIGHT-CAR BELL-CORD
GUIDE.
Lignum-vitæ Screws ($\frac{1}{2}$ full size).



Fig. 720.
BELL-CORD GUIDE, with Screw,
Flange and Pulley.



Fig. 721.
BELL-CORD GUIDE, with
Screw and Pulley.

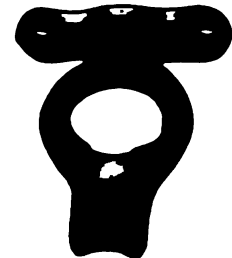


Fig. 722.
BELL-CORD GUIDE, with
Flange and Pulley.



Fig. 723.
BELL-CORD GUIDE, with
Flange and Side-pulley.

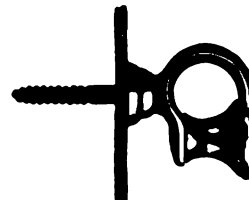


Fig. 724.
BELL-CORD GUIDE, with Screw,
Flange and Side-pulley.



Fig. 725.
BELL-CORD GUIDE, with Screw
and Side-pulley.



Fig. 726.
BELL-CORD GUIDE,
with two Pulleys.



Fig. 727.
BELL-CORD GUIDE,
with four Pulleys.



Fig. 728.
BELL-CORD GUIDE,
with Centre-pulley.



Fig. 729.
BELL-CORD GUIDE WASHER.



Fig. 730.



Fig. 731.
AND BEARS CORD GUIDE
($\frac{1}{2}$ full size).



2. Bell-cord Strap.
3. Bell-cord Strap-hanger-Bracket.
4. Bell-cord Guide.
5. Bell-cord Rod.

Fig. 732.
BELL-CORD FIXED HANGER.
(Standard sizes, 4½, 5½
and 6 in. drop.)

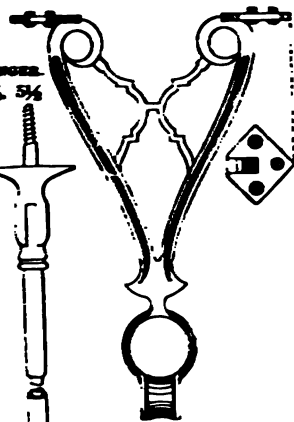


Fig. 733.
BELL-CORD FIXED
HANGER.
(¾ full size.)



Fig. 730.
BELL-CORD
BUSHING.



Fig. 734.
BELL-CORD STRAP
HANGER.



Fig. 743. BELL-CORD SPLIT.



Fig. 735.
BELL-CORD H
HANGER.
(16 in. full)



Fig. 746.
SLIDING-DOOR LOCK, FLUSH HANDLE.
(3 1/4 x 4 1/4 in.)



Fig. 747. SLIDING-DOOR PULL.
(Round face, 2 1/4 x 4 1/4 in. Also made square face.)



Fig. 749.
SLIDING-DOOR LOCK KEEPER.



Fig. 748.
SLIDING-DOOR LOCK.
(3 1/4 x 7 1/4 in.)

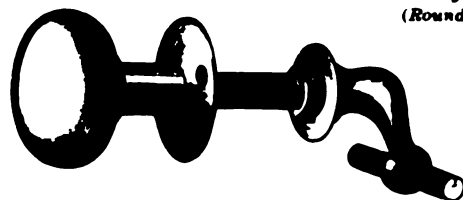


Fig. 750. T DOOR-KNOB,
for narrow-stile doors.



Fig. 781.
DOOR BUTTON.

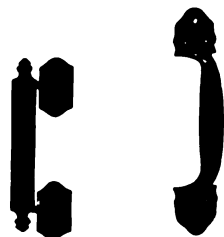


Fig. 752.
DOOR-PULL.
Round Handle.)



Fig. 753.
DOOR-PULL.
(Flat Handle.)



Fig. 784.
DOOR-BUTTON AND PLATE.

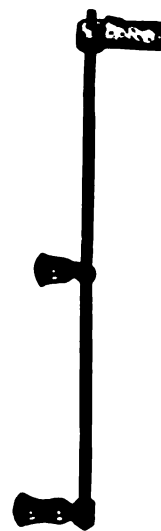


Fig. 755.
TORREY
DOOR SPRING
(25 to 30 in. long.)



Fig. 756.
"BEE"
DOOR-SPRING.



Fig. 757.
"OEN"
DOOR-SPRING.



Fig. 758.
SQUARE DOOR-BOLT.



Fig. 759.
SQUARE-NECK DOOR-BOLT.



Fig. 760.
BARREL DOOR-BOLT.
1. Door-bolt Keeper.



Fig. 761.
FLUSH DOOR-BOLT.

(See also FURNISHINGS ; LOCKS.)

FURNISHINGS, Doors ; Door Stops. Etc.



Fig. 762.
DOOR-HOLDER.
($\frac{3}{4}$ full size)



Fig. 761.
DOOR-FLOOR-STOP.



Fig. 763.
DOOR-HOLDER PARTITION-STOP.
($\frac{3}{4}$ full size.)



Fig. 772.
DOOR-STOP.



Fig.

NOTI

Shown in positi

Fig.

DOOR-H



Fig.

DOOR-SASH



Fig. 779.
FAST-JOINT BUTT-HINGE.



Fig. 780.
LOOSE-JOINT BUTT-HINGE.

(Butt-hinges are commonly termed simply Butts.)



Fig. 782.
LOOSE-PIN BUTT-HINGE.

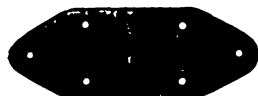


Fig. 781.
HOPPER BUTT-HINGE.

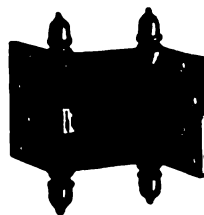


Fig. 785.
DOUBLE-ACTING SPRING-HINGE.
(Height of flanges,
2 1/4" to 7".)



Fig. 788.
"UTILITY" DOUBLE-ACTING SPRING-HINGE.



Fig. 786. PARLIAMENT HINGE.

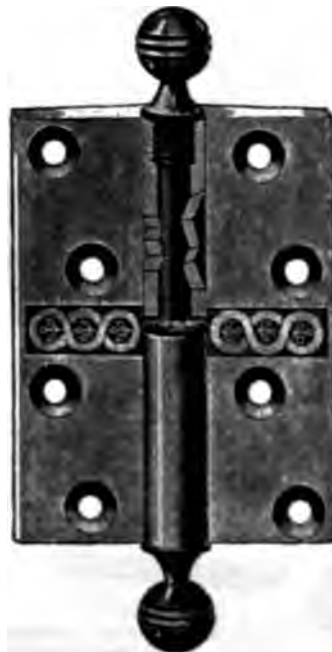


Fig. 789. ACROSS BUTT-HINGE. (With
knuckle broken open, showing
washer-bearing for HINGE PIN.)



Fig. 783.
STRAP-HINGE.



Fig. 784.
T-HINGE.



Fig. 787.
DOUBLE-ACTING SPRING-HINGE.



Fig. 790.
BLANK HINGE.
(For use with double-acting spring-
hinge. Also made with half-
round flange.)



Fig. 791.
HATFIELD HANGING-DOOR SRAVE.
(Used for both passenger and freight cars.)

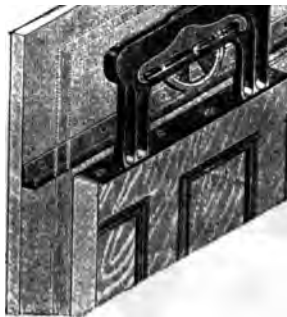


Fig. 793.
"ANTI-FRICTION" CAR-DOOR SRAVE

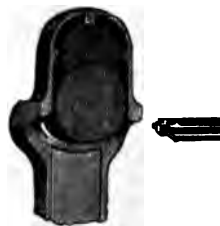


Fig. 798.



Fig. 799.





Fig. 802.
CARPET EYELETS AND NAILS.



Fig. 806.
PERFORATED-RUBBER FLOOR-
MAT.
($\frac{1}{4}$ to $\frac{1}{2}$ in. thick)



Fig. 810.
"PROTECTION" CUPIDOL, with
MAT.
(Mat, 12 in. diameter.)



Fig. 808.
SPITTOON.



Fig. 809.
CUPIDOL.



Fig. 803.



Fig. 804.

UPPER AND LOWER GROMMETS FOR
CARPET-EYELETS.



Fig. 805.
WIRE EYELET-NAIL, with turned Knob.



Fig. 807.
CORRUGATED-RUBBER FLOOR-MAT.



Fig. 811.
"PROTECTION" CUPIDOL, with Um-
BRELLA-BASE.

FURNISHINGS, Gas Fixtures; *Pintsch System.*

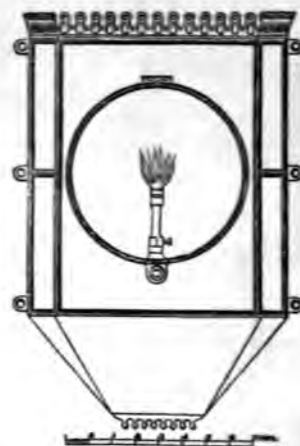
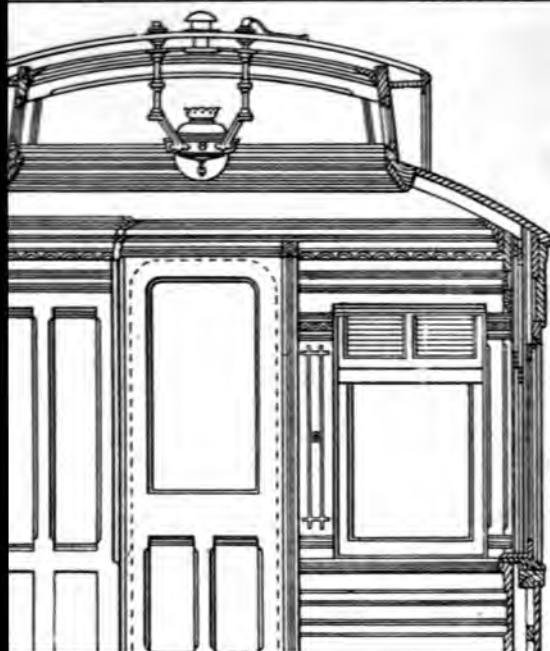


Fig. 814.

SIDE-LIGHT, FOR S.

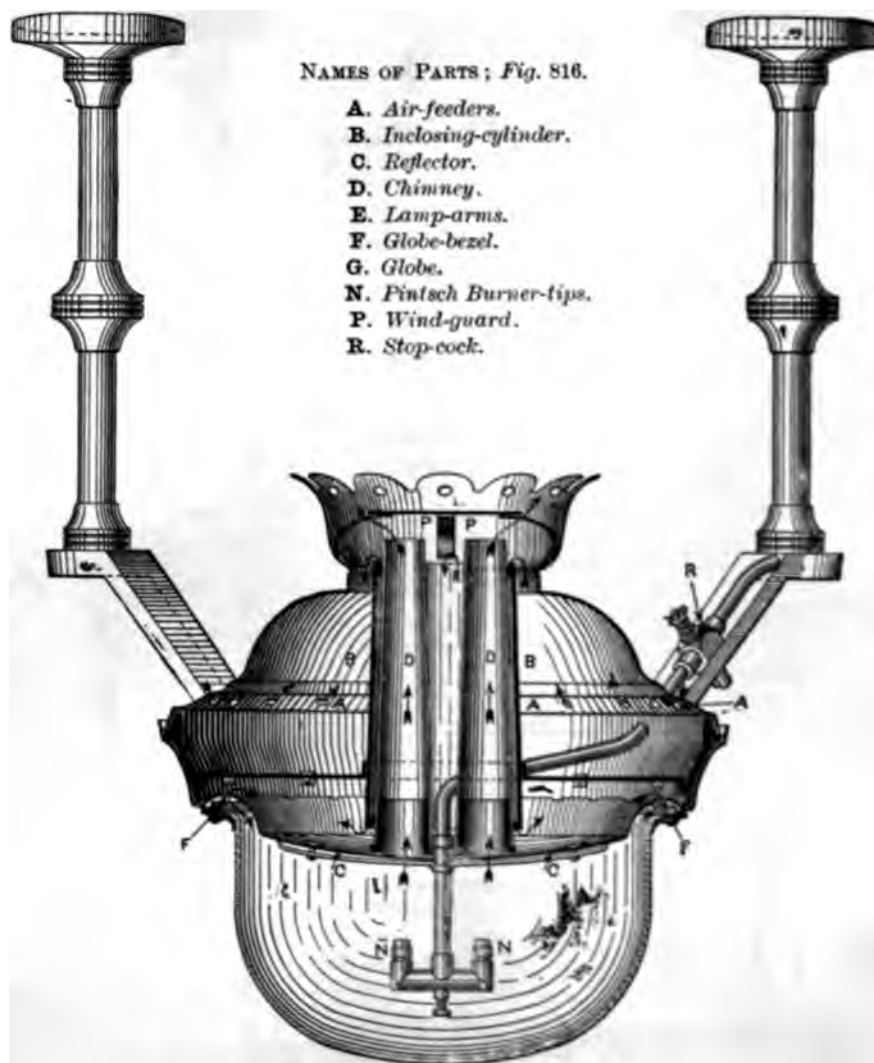


Fig. 816. PINTSCH TWO-LIGHT STANDARD GAS-BURNER.

(Four-light burners are the same in substance and are generally used in the United States. Four-light burners of this pattern burn about $2\frac{1}{4}$ cu. ft. per hour. The air-supply is heated before reaching the flame, to increase the efficiency of the burner.)

Numbers refer to List on following page.

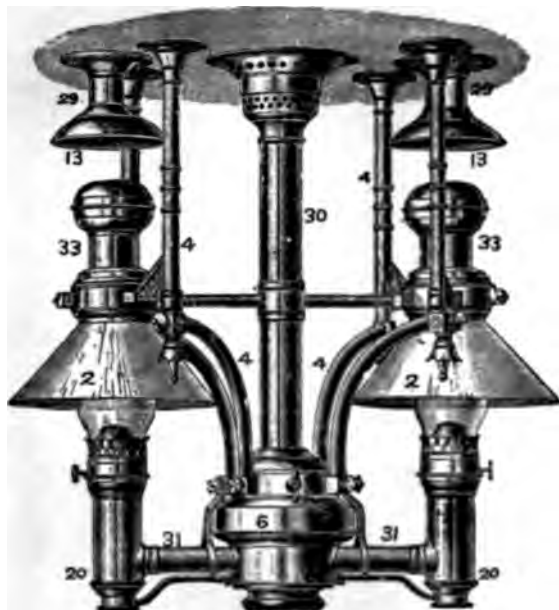


Fig. 835.

DOUBLE "HURRICANE" CENTRE-LAMP OR CHANDELIER.
HICKS & SMITH patent. (Drop, 24 in.).

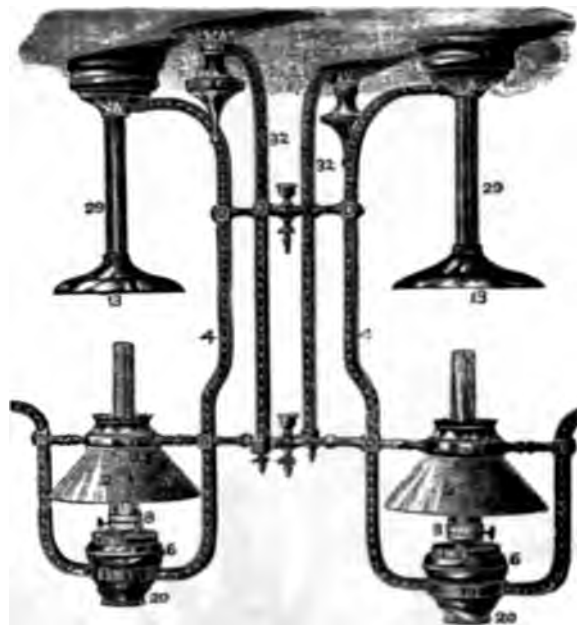


Fig. 836.

DOUBLE CENTRE-LAMP OR CHANDELIER.
(ABOARD OR DUAL BURNERS, Figs. 837-838.) Drop, 32 in.)

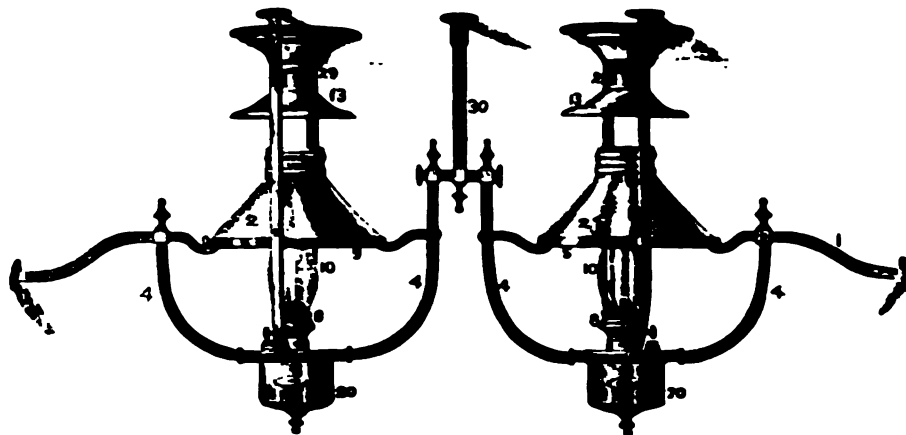


Fig. 837.

DOUBLE CENTRE-LAMP OR CHANDELIER.

FURNISHINGS, Lamps; *Centre-lamps.*



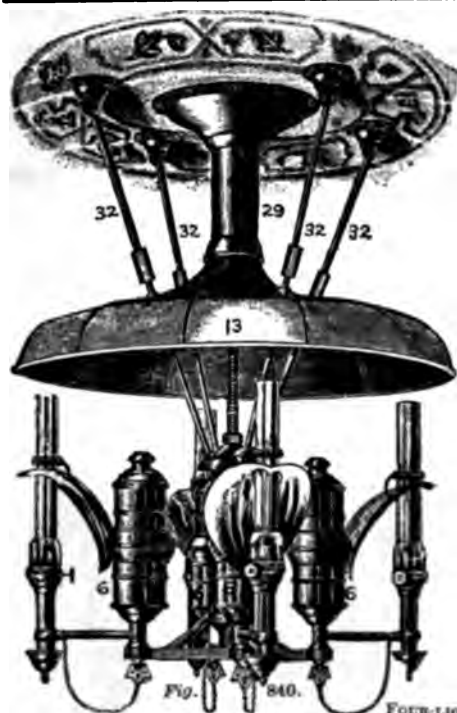


Fig. 840.

FOUR-LIGHT CENTRE-LAMP OR CHANDELIER.

Numbers refer to List on preceding page.

ADDITIONAL NAMES OF PARTS FOR Figs. 841-842.

- A. Smoke-bell, or Canopy.
- B. Protection-cap, or Wind-guard.
- C. Collar, for Smoke-bell Stem.
- D. Revolving Lamp-disk.
- E. Draft Valve.
- F. Centre-rod.
- G. Roof-brace Hub.

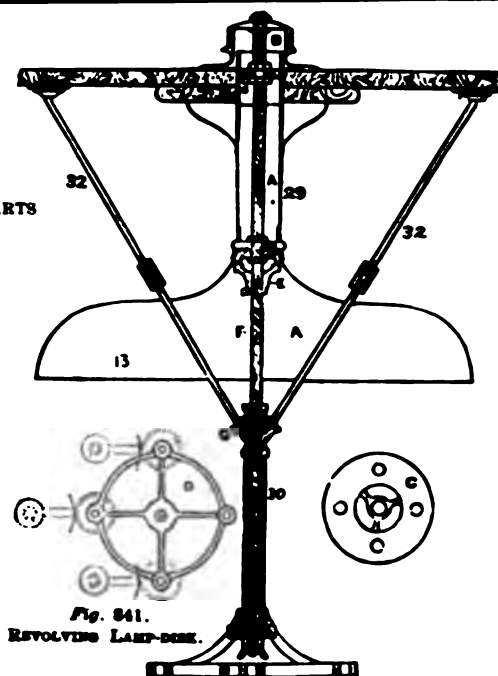


Fig. 841.

REVOLVING LAMP-DISK.

Fig. 842.

Construction details of Chandelier, Fig. 840.



Fig. 843.

CENTRE-LAMP.

20 (Old Style).

"HARRISON" PATTERN.
(Drop, 40 in.) (Especially designed for Postal Car Service. The burners and reservoirs revolve separately on RESERVOIR-PIVOTS and collectively on a REVOLVING LAMP-DISK (Fig. 841) so as to concentrate the light wherever desired.)



Fig. 844.

CENTRE-LAMP, for narrow-gauge cars and street-cars,

WITH FLUTED-GLASS REFLECTOR.

FURNITURE, Lamps, Ceiling-lamps.



LIST OF PARTS OF LAMP.

1. Lamp-top.
2. Lamp-body.
3. Lamp-glass Chimney.
4. Lamp-arm.
5. Lamp-ring.
6. Lamp-mermaid.
7. Glass-holder.
8. Lamp-burner.
- 9-9. Ring of Lamp.
10. Lamp-chimney.
11. Lamp-chimney Holder.
12. Lamp-chimney Bracket.
13. Shade-hill.
14. Lamp-reflector.
15. Lamp-chimney Reflector.
16. Side-lamp Holder.
17. Side-lamp Bracket.





Numbers refer to List on preceding page.

Fig. 848. THREE-LIGHT CANDLE CHANDELIER, with ADJUSTABLE GLOBES
(Drop, 28 in.)

NAMES OF PARTS, MOEHRING ARGAND LAMP; Figs. 849-850.

- | | |
|-----------------------------|--------------------|
| A. Reservoir, or Lamp-body. | c. Lamp-base Stem. |
| B. Lamp-burner. | d. Drip-hole. |
| C. Well. | e. Drip-shield. |
| D. Lamp-base. | f. Drip-spout. |
| E. Lamp-bottom. | g. Air-holes. |
| a. Centre Draft-tube. | h. Filling-groove. |
| b. Lamp-base Collar. | i. Filling-tube. |

(Perspective View of Burner, Fig. 872.)

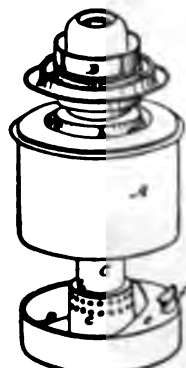


Fig. 849.
Perspective View.
MOEHRING ARGAND LAMP.

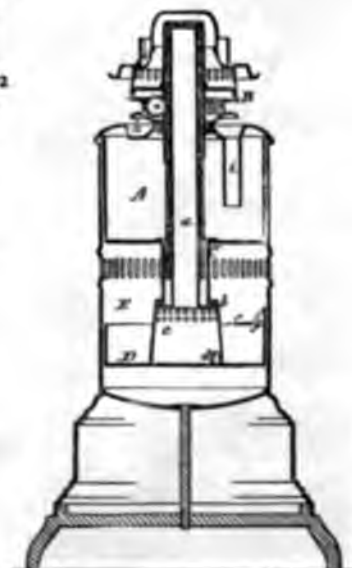
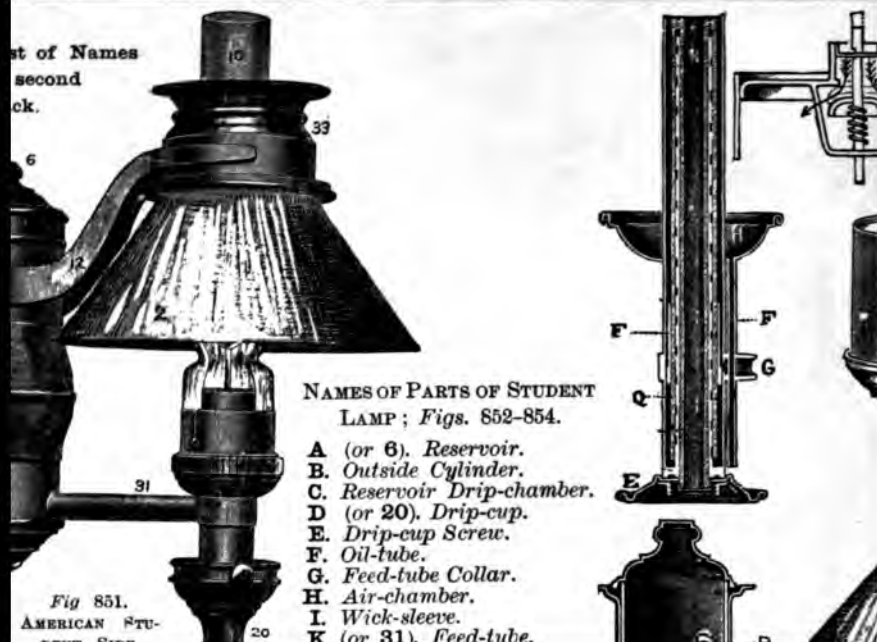


Fig. 850.
Section.
MOEHRING ARGAND LAMP.

FURNISHINGS, Lamps ; Side-lamps.



Numbers refer to List of Names of Parts on third page back.



Fig. 860.
"HURRICANE" SIDE-LAMP.



Fig. 861.
ALCOVE-LAMP for Sleeping Cars.
(See Figs. 855 and 864.)



Fig. 862.
POSTAL CAR SIDE-LAMP.



Fig. 863. POSTAL CAR SIDE-LAMP.



Reflector, 8 1/4
in. diameter, 3 3/4
in. deep.

Fig. 864.

SIDE PANEL-LAMP, for oil or candle.
(Principally for sleeping cars. Used in
panels between windows arranged as in
Fig. 878. Usually covered during the
day by Mirror-case, Fig. 1256.)

Figs. 865-871. FURNISHINGS, Lamps ; Side-lamps.

Numbers refer to List of Names of Parts on fourth page back.



Fig. 865.
SIDE-LAMP.
ARGAND OR DUAL burner.



Fig. 866. SIDE-LAMP, with combined Reflector and
Chimney-holder. (ARGAND burner.)
See also Fig. 938.



Fig. 867. "TORNADO" SIDE-LAMP.
able SHADE-HOLDER
(No. 3 DUAL burner.)



Fig. 868.
SIDE-LAMP, with adjustable
or loose Globe.

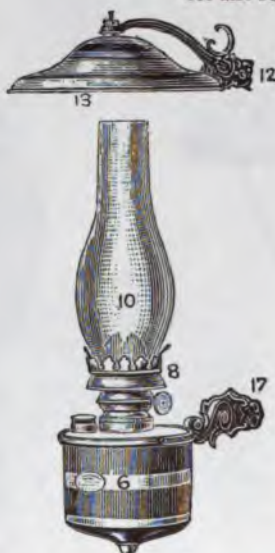


Fig. 869. SIDE-LAMP, with separate
Smoke-bell and SMOKE-BELL BRACKET.



Fig. 870. SIDE-LAMP.
For candles.



POSTAL



Fig. 872.
MORNING ARGAND BURNER.
($\frac{3}{4}$ full size.)

No. 10 chimney, Fig. 928. Burner shown in Section, Fig. 850.

The TAPER BURNER is the same as Dual No. 2, Figs. 873-874, except that it has two wicks in one tube instead of a separate tube for each wick.



Fig. 876.
HEADLIGHT BURNER.
(For 16 to 23 in. headlight refecture.)



Fig. 873. DUAL BURNER. ($\frac{3}{4}$ full size.)
No. 2 or B. with SKIRT. (2, 3 and 8 chimney, Figs. 926-927.)



Fig. 874. DUAL BURNER. Section.



Fig. 877. DUAL BURNER. No. 3 or D. without skirt.
(No. 24 chimney, Fig. 934.)



Fig. 875.
"BRILLIANT" ARGAND BURNER.
($\frac{3}{4}$ full size.)

Nos. 1 and 2, Small Student (No. 8 chimney). No. 3, Large Student (No. 7 chimney, Figs. 926-928.)



Fig. 878.
ASTRAL ARGAND BURNER.
(No. 8 chimney, Figs. 926-928 list.)

URNISHINGS, Lamp Burners.



879.
BURNER ($\frac{3}{4}$ full size).
(See Burners, Figs. 926-933.)



No. 4.
Fig. 880.



Fig. 8
TWO-SPRING SI





Fig. 887.
"SUN-HINGE" BURNER.
(Sun-hinge Chimney, Nos. 14 and 17, Fig. 437.)



Fig. 888.
"BURR" SUN BURNER.



Fig. 889.
SUN BURNER.
(Original Form.)



Fig. 890.
NO CHIMNEY SUN-HINGE BURNER.



Fig. 892.
SCREW BURNER.
(Old Style.)



Fig. 893.
OIL TASTER.
(For directions see Dictionary.)



Fig. 894.
HINGE BURNER.
(Old Style.)



Fig. 895.
HINGE BURNER.
(Old Style.)

ys. 896-906. FURNISHINGS, Lamp Burners ; No Chimney.

Fig. 890 on preceding page and Figs. 896-961 on this page are No-chimney.



Fig. 896. "ALADDIN."
Short Body.



Fig. 897. "SAVAGE."



Fig. 898. "ALADDIN."
Long Body.





Fig. 907.
TRAIN-SIGNAL, TAIL, OR BULL'S-
EYE LAMP.

(Others of this class are shown in
Figs. 950-971.)



Fig. 911.
OIL-SCREWS, TUNED.



Fig. 912.
OIL-SCREWS, TUNED, WITH HEATER-
PLATE.



Fig. 913.
LARD-OIL RATCHET
BURNER.

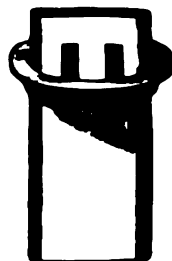


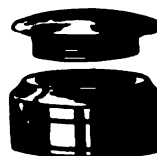
Fig. 914.
LARD-LAMP SCREW.



Fig. 909.
REDUCING COLLAR.



Fig. 910.
EXPANDING COLLAR.



Figs. 915-916.
FEEDER-TIP AND COL-
LAR.



Fig. 917.
OIL-SCREW.
(Made blank or pierced.)



Fig. 918.
OIL-LAMP HOOP.
(Ruffled.)



Fig. 919.
OIL-SCREW.
(Hollow.)



Fig. 908.
TUBULAR SQUARE LAMP.
(27 in. high.)



Fig. 920.
LAMP-COLLAR.



Fig. 921.
SOLID LAMP-HOOP



Figs. 922-923.
OIL-SCREW AND HOOP.



Figs. 924-925.
FEEDER-SCREW AND HOOP.

FURNISHINGS, Lamp Chimneys and Shades.

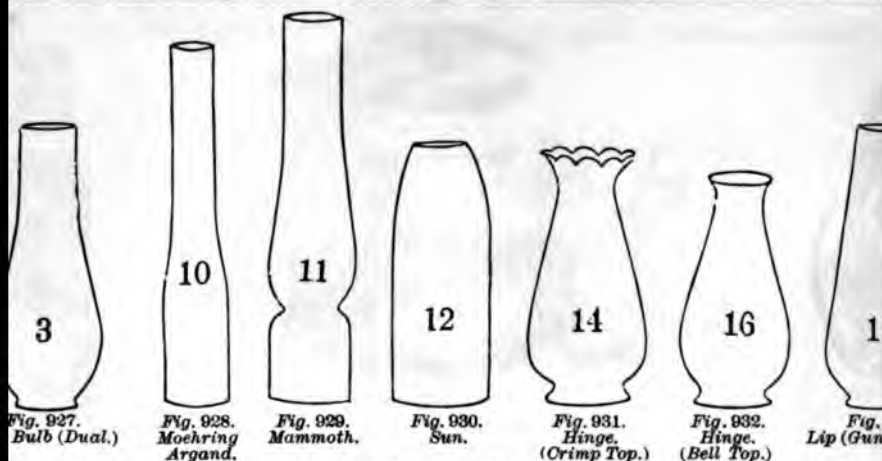


Fig. 927.
Bulb (Dual.)

Fig. 928.
Moehring
Argand.

Fig. 929.
Mammoth.

Fig. 930.
Sun.

Fig. 931.
Hinge.
(Crimp Top.)

Fig. 932.
Hinge.
(Bell Top.)

Fig. 933.
Lip (Gun)

LAMP CHIMNEYS. (See table of Standard dimensions in Dictionary under LAMP CHIMNEYS. The trade is general, but not universal.)

**COMBINED REFLECTOR AND
CHIMNEY-HOLDER.**
(See also Fig. 866.)



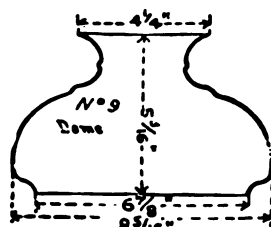


Fig. 945.

"DOME" LAMP-SHADE.

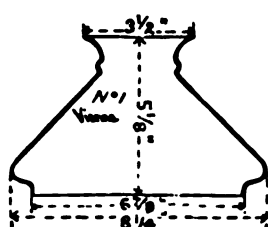


Fig. 946.

"VIENNA" LAMP-SHADE.

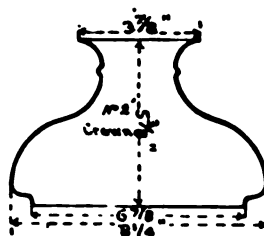


Fig. 947.

"CROWN" LAMP-SHADE.

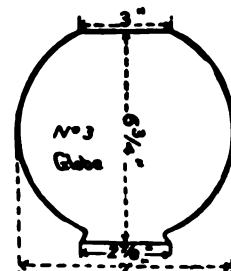


Fig. 948.

"GLOBE" LAMP-SHADE OR LAMP-GLOBE.

STANDARD STYLES OF LAMP-SHADES: SPECIAL FORMS FOR STUDENT AND OTHER LAMPS.

(See also "LAMP-SHADE" in Dictionary.)

(The use of these Standards in the trade is general, but not universal.)



Fig. 949.

ROUND LAMP-GLOBE.

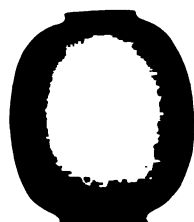


Fig. 950.

MELON-SHAPED LAMP-GLOBE.



Fig. 951.

EGG-SHAPED LAMP-GLOBE.



Fig. 952.

PEAR-SHAPED LAMP-GLOBE.



Fig. 953.

DOUBLE-CORN-SHAPED LAMP-GLOBE.



Fig. 954.
Section.



Fig. 955.
Front View.

SEMAPHORE LENS.

(A modified form of the Fresnel Lens, Figs. 957-958.)



Fig. 956. DOUBLE-LENS, TAIL, BULL'S-EYE OR FISH-TAIL LAMP.

(Others of this class are shown in Figs. 959-971.)



Fig. 957.
Front View.



Fig. 958.
Section.

FRESNEL LENS.

FURNISHINGS, Lanterns.



9.
LIGHT.
(Standard.)



Fig. 960.

TRICOLORED INSPECTOR'S LAMP.

(Another device for the same purpose is shown in Figs. 972-973.)



SQUARE RAIL



Fig. 965. Carrying "Blizzard" Signal-light.
COOLBAUGH'S SIGNAL-LIGHT HOLDER.



Fig. 966. Folded up, not in use.
(Weight, 2 lbs.)



Fig. 967.
Folded up, carrying flag.
COOLBAUGH'S LANTERN AND FLAG-HOLDER, with THREE-WAY JOINT



Fig. 968.
In use, carrying Lamp.
COOLBAUGH'S LANTERN AND FLAG-HOLDER, with THREE-WAY JOINT



Fig. 969. (8-in. lens; 4 3/4-in. wide plain light.)
TRAIN-SIGNAL OR TAIL-LAMP.



Fig. 970. TRAIN-SIGNAL OR TAIL-LIGHT.
(Carried by a SOCKET-PLATE, BRACKET and BRACKET-PIECE.)



Fig. 971.
OPERATORS' TRAIN-ORDER TARGET LAMP.
(3-in. Hemispherical lens.)

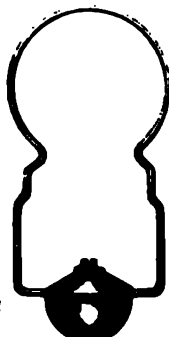


Fig. 972.
Lamp and Handle.

BOWMAN, BROWN & CO.



Fig. 973.

see to show in Fig. 968.)

FURNISHINGS, Lanterns.



Fig. 975.



Fig. 976. Bail and Cap.



Fig. 977. Reflector.



Fig. 978. Showing movable Globe-holder.

CONDUCTOR'S LANTERN (New Style).

LOCKS.

NAMES OF PARTS OF LOCKS; Figs. 987-999.

1. Door-latch Bolt.
2. Door-latch Hook.
3. Door-latch Hook-keeper.

4. Door-latch Rose.
5. Door-knob.
6. Sliding-door Handle.

7. Door-lock Bolt.
8. Door-lock Keeper.

9. Door-latch Keeper.
10. Door-latch Spindle.



Fig. 987.
CAR-DOOR LOCK.



Fig. 988.
BAGGAGE CAR-DOOR LOCK.



Fig. 989.
SALOON LATCH.



Fig. 990.
SLIDING-DOOR LATCH.



Fig. 991.
SLIDING-DOOR LOCK.



Fig. 992.
WIN LOCK OR DEAD LOCK.



Fig. 993.
MORTISE LOCK.



Fig. 994.
RABBETED LOCK.

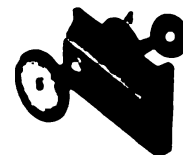


Fig. 995.
SPRING DOOR-LATCH OR
NIGHT-LATCH.



Fig. 996.
BERTH-LATCH HANDLE.
1. Berth-latch Face-plate.



Fig. 997.
CUPBOARD-CATCH OR FLUSH-BOLT.



Fig. 998.
CUPBOARD-LATCH.

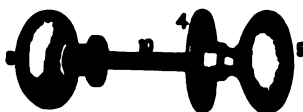


Fig. 999.
DOOR-SPINDLE AND KNOB.

(The swinging plate which covers the key-hole in an escutcheon (as A, Fig. 1011), is also commonly called ESCUTCHEON, but more properly an ESCUTCHEON-PLATE.)



Fig. 1000. Fig. 1001.
ESCUTCHEONS.



Fig. 1002.
DOOR-LATCH ROSE AND
ESCUTCHEON.

See also FURNISHINGS, DOOR.

FURNISHINGS, Locks.

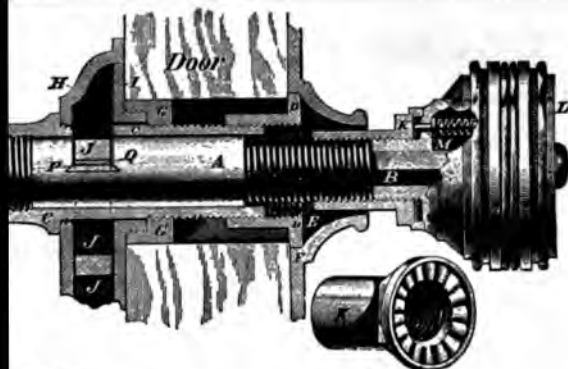


Fig. 1003.

KIRBY'S CAR-DOOR LOCK.
(Screwless Knob and Spindle.)

Fig. 1004.

NAMES OF PARTS; Figs. 1003-1004.

- | | | | |
|---------|------|------------------|-----------------------|
| nob. | E. { | Door-latch Rose. | K. Coupling-sleeve. |
| | F. { | | L. Outside Knob. |
| | G. | Lock-nut. | M. Ratchet-bolt. |
| | H. | Inside-shell. | P. Shank-facing. |
| collar. | I. | Back-plate. | Q. Latch-bolt facing. |
| | J. | Latch-pull. | |

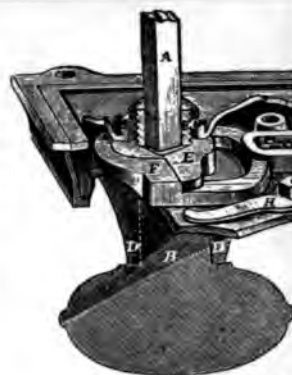


Fig. 1005.

CAR-DOOR LOCK.
(Screwless Knob and Spindle.)

NAMES OF PARTS;

- | | |
|----|----------------|
| A. | Spindle. |
| B. | Door-knob. |
| C. | Flange-collar. |
| D. | Sleeve. |
| F. | Yoke. |
| G. | Stop-bolt. |



NAMES OF PARTS ;

Fig. 1011.

- A. Escutcheon, or Es-**
cutcheon-plate (see
Fig. 1000).
- B. Glass Seal.**
- C. Key.**
- D. Glass-plate Guide.**
- E. Lock Bolt.**
- F. Lock-bolt Catch.**
- G. Clasp.**
- H. Door-hasp Pin.**
- I. Door-hasp.**
- K. Tag-holder Clasp.**
- L. Tag-holder.**
- M. Tag.**
- N. Lugs or Standards.**

Fig. 1011. FREIGHT-CAR SEAL-LOCK.
(Also made to be used without key, the seal only
serving as a lock.)



Fig. 1014. STATIONARY SEAL HOLDER.



Fig. 1017. STATIONARY FREIGHT-CAR LOCK.
(The catch that holds the hasp locks by the act of moving it to place.)



Fig. 1012.
FREIGHT-CAR
LOCK.



Fig. 1013.
CHAIN BOLT,
with SEAL.
(Takes padlock.)



Fig. 1016.
CHAIN LOCK FOR GLASS
SEAL.



Fig. 1015.
PAPER AND GLASS SEAL-
HOLDER.
(U. S. Customs.)

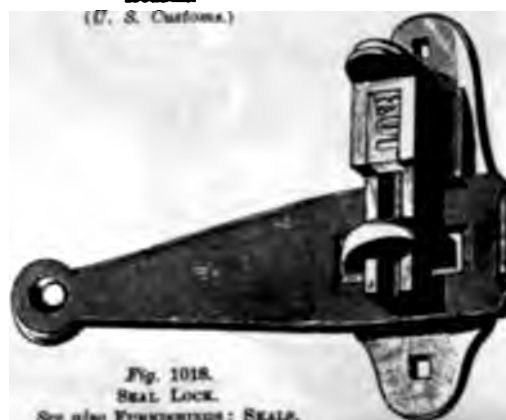


Fig. 1018.
SEAL LOCK.
See also FURNISHINGS: SEALS.

FURNISHINGS; Locks and Padlocks.

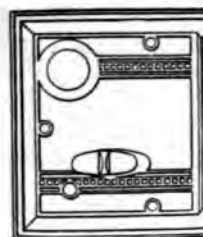
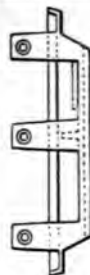


Fig. 1020.
CAR-DOOR LOCK KEEPER.

Fig. 1021.
CAR-DOOR LOCK KEEPER.

Fig. 1022.
SALOON LOCK.
(4 15-16x4 1/8 in.)

Fig. 1023.
DOOR-KNOB.

Figs. 1019 to 1025. DETAILS OF PENNSYLVANIA RAILROAD STANDARD PASSENGER-CAR LOCKS.

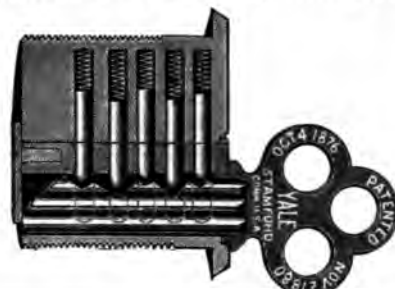
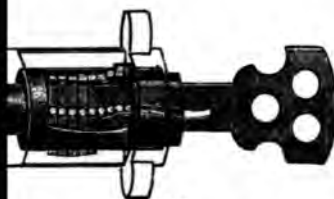
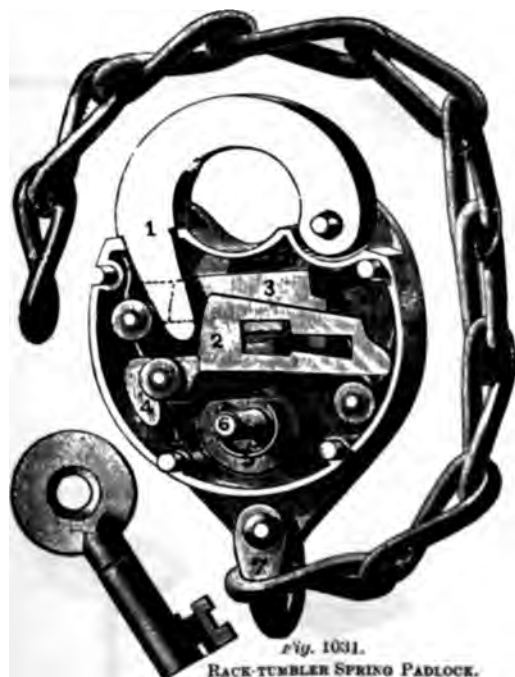


Fig. 1026.
FOSTER RIM NIGHT-LATCH.

Fig. 1031.
RACK-TUMBLER SPRING PADLOCK.

- | | | |
|------------------|-------------|------------|
| 1. Shackle. | 4. Tumbler. | 7. Clavis. |
| 2. Tumbler. | 5. Ward. | 8. Case. |
| 3. Sliding Bolt. | 6. Pivot. | |

Fig. 1034. (3/4 full size).
"RAILROAD" PADLOCK, BAR SHACKLE.Fig. 1035.
"RAILROAD" PADLOCK.
(Cheap grade, with external bars
for shackle.)Fig. 1032. Closed.
(3/4 full size.)

Fig. 1033.

Showing instance in which scratch on
drop catches on.

"RAILROAD" PADLOCK



Fig. 1036. Outside View.



Fig. 1037. Interior View.

MILLER'S SELF-LOCKING PADLOCK

NAMES OF PARTS: Figs. 1036-7.

- | | |
|--------------------|--------------------|
| A. Tumbler. | E. Tumbler. |
| B. Shackle. | F. Tumbler spring. |
| C. Tumbler-dog. | G. Key hole. |
| D. Shackle-spring. | H. Shackle-stop. |

49. FURNISHINGS, Miscellaneous.

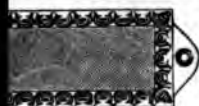


Fig. 1038.
LATCH-STRIKER.



Fig. 1039.
LATCH-STRIKER FRAME.

various kinds are shown in
figs. 1546-1552.



Fig. 1040.
STANCHION.



Fig. 1044.
BARCOCK FIRE-EXTIN-



Fig. 1042.
DRAWER-PULL.

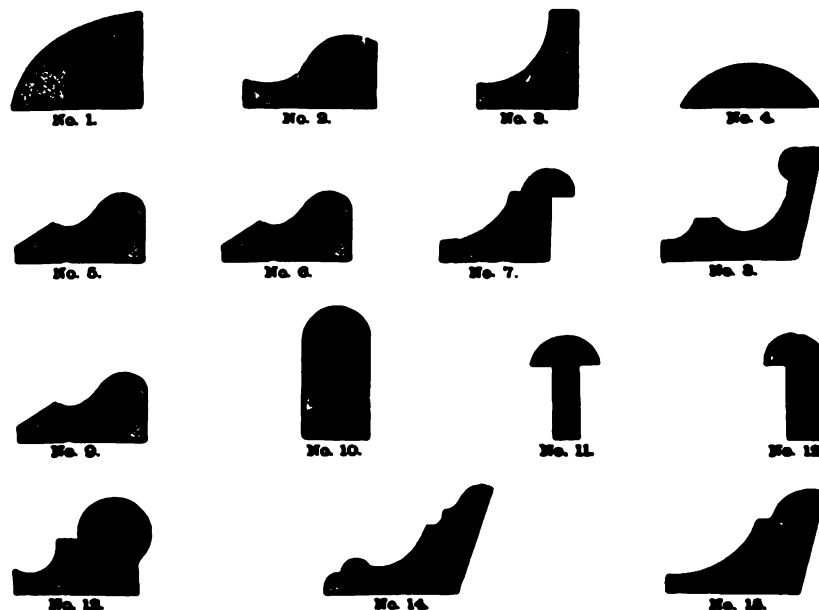


Fig. 1043.
DANGER-SIGNAL and SIGNAL.



Fig. 1045.
"PENFOLD" CARD-RACK.
(Attached to car-bodies as





Figs. 1050 to 1064. STANDARD FORMS OF GILT CAR MOULDINGS; made both PLAIN and WAVED

Other sizes, and an infinite variety of other sections, are manufactured. The above are simply certain sections known to the trade as standard and usually carried in stock, with the following variations in size:

No. 1.
 $\frac{1}{2} \times \frac{1}{2}$ in., face gill.
 $\frac{3}{4} \times \frac{1}{2}$ " " "
 $\frac{3}{4} \times \frac{3}{4}$ " " "
 $\frac{1}{2} \times \frac{3}{4}$ " " "
 $\frac{1}{2} \times \frac{1}{2}$ " " "
 $\frac{3}{4} \times \frac{1}{2}$ " " "

No. 2.
 $\frac{3}{4}$ in. base, two faces gill.
 $\frac{1}{2}$ " " " "
 $\frac{3}{4}$ " " " "
 $\frac{1}{2}$ " " " "
 $\frac{3}{4}$ " " " "
 1 " " " "

No. 3.
 $\frac{3}{4} \times \frac{1}{2}$ in., three faces gill.
 $\frac{3}{4} \times \frac{1}{2}$ " " "

No. 4.
 $\frac{1}{2}$ in. base, face gill.
 $\frac{3}{4}$ " " " "
 $\frac{1}{2}$ " " " "
 $\frac{3}{4}$ " " " "
 $\frac{1}{2}$ " " " "
 1 " " " "

No. 5.
 $\frac{3}{4}$ in. base, face gill.
 1 " " " "

No. 6.
 $\frac{3}{4}$ in. base, face gill.
 $\frac{3}{4}$ " " " "

No. 7.
 $\frac{3}{4}$ in. base, face gill.

No. 8.
 $1\frac{1}{2}$ in. base, face gill.

No. 9.
 $1\frac{1}{2}$ in. base, face gill.
No. 10.
 $1 \times \frac{3}{4}$ in., one side gill.
 $1 \times \frac{1}{2}$ " " "

No. 11.
 $\frac{3}{4}$ in. bead, face gill.
 $\frac{1}{2}$ " " " "

No. 12.
 $\frac{3}{4}$ in. bead, face gill.

No. 13.
 1 in. base, all faces gill.
 $1\frac{1}{2}$ " " " "

No. 14.
 $1\frac{1}{2}$ in. base, gill or Gr. Cen.
 $2\frac{1}{2}$ " " " "

No. 15.
 $1\frac{1}{2}$ in. base, all faces gill.

URNISHINGS, Postal Car; *Forms Special to Postals.*



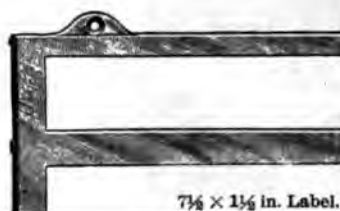
Fig. 1066.
SCHEME-ROD BRACKET, with screw.
(For $\frac{3}{4}$ -in. rod; projects 2 in.)



Fig. 1067.
WINDOW-ROD BUSHING.
($\frac{1}{4}$ -in. hole; $1\frac{3}{8}$ -in. diameter.)



Fig. 1068.
SCHEME-ROD BRACKET.
($\frac{3}{8}$ full)



$7\frac{1}{2} \times 1\frac{1}{4}$ in. Label.

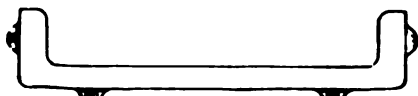


Fig. 1076. LABEL-HOLDER.



Fig. 1077.

COMBINED LABEL-HOLDER AND DRAWER PULL.
(Figs. 1076-1077 take a 7/8-in. card.)

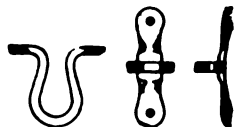


Fig. 1080.
HAND-RAIL BRACKET.
(1/4 full size.)



Fig. 1078. STRAP-SHEAVE.

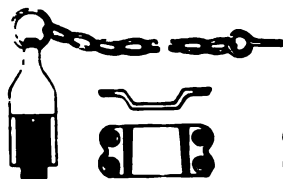


Fig. 1081.

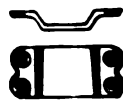


Fig. 1082.



Fig. 1083.

DOOR-BOLT AND DOOR-BOLT CLASP, with CHAIN and EYE.



Fig. 1084.
Front View.
HAND-RAIL BRACKET.
(1/4 full size.)

Fig. 1085.
Side View.

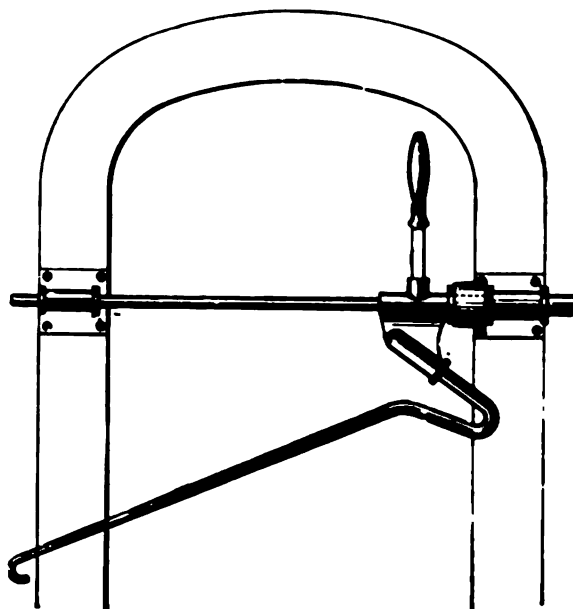


Fig. 1086. NAIL-CATCHER.

FURNISHINGS, Saloon.

1087.
Closed.



RD'S PARLOR CAR

MEASURE

Fig. 1088.

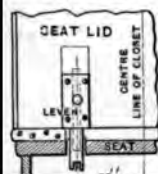
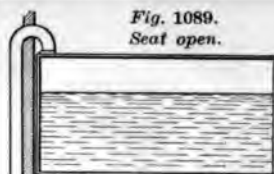


Fig. 1089.
Seat open.



WATER CLOSET.



Fig. 1090.
Oblique CLOSET-HOPPER.
With pipe for WIND-SCOOP.



Fig. 1091.
Coned CLOSET-HOPPER.

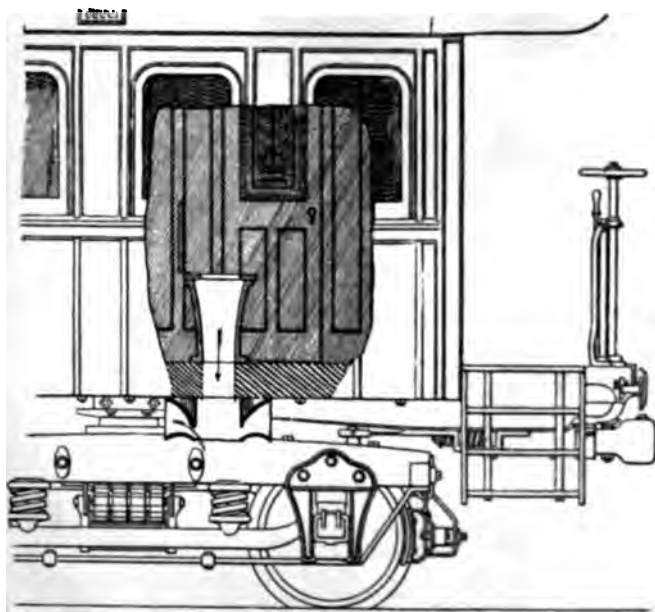


Fig. 1097. Section through Closet-hopper.

BELL'S EXHAUST HOPPER-VENTILATOR.

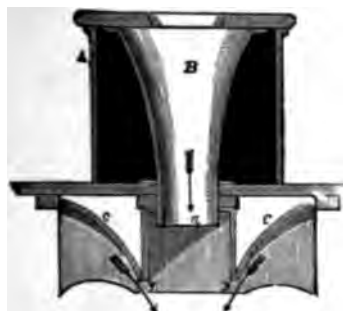


Fig. 1098. Enlarged section.

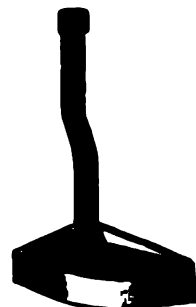
BELL'S EXHAUST HOPPER-VENTILATOR.

A. Closet-hopper Casing.

B. Closet-hopper.

C. Cone.

y. Throat of Ventilator.

Fig. 1099.
SALOON NOTICE-PLATE.Fig. 1100.
CORNER URINAL.
With front projection
and ventilating-pipe.Fig. 1101.
CORNER URINAL
VENTILATOR.Fig. 1102.
VENTILATOR CAP
for Corner Urinal.Fig. 1103.
URINAL DRIP PAN.
(Urinal sizes, 12 x 12,
15 x 15, 9 x 14,
10 x 14 in.)Fig. 1104.
CORNER URINAL.
Plain.Fig. 1105.
SIDE URINAL.
Plain.
B. Urinal-pipe.

(SIDE URINALS are also made with the attachments shown in Figs. 1100 to 1103 for corner urinals, but side urinals are rarely used in passenger cars.)

(CONCEALING URINALS, to be opened for use by a handle at the top, and then closed up flush with the wood-work, are also in limited use, but not generally approved.)

Figs. 1106-1109. FURNISHINGS, Saloon.



Fig. 1106.
SIDE URINAL-HANDLE.

FURNISHINGS; Seals and

Additional Freight-car Locks are shown

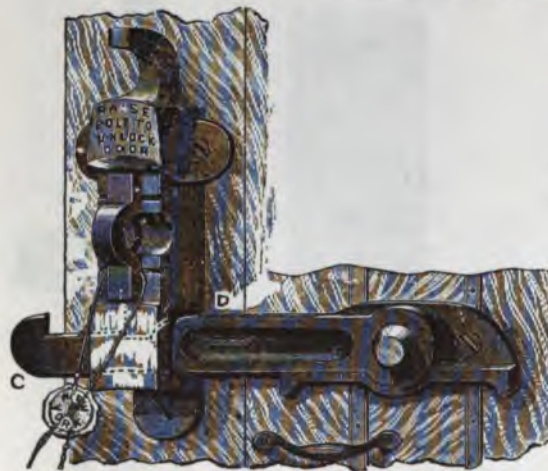


Fig. 1108. No. 1. Right-hand.

BROOKS' "STANDARD" CAR-
(Made either right or

NAMES OF PARTS, CAR-DOOR FASTENERS

- A.** Opening, for Seal-wire.
- B.** Padlock Hasp.
- C.** Second Catch.
- D.** Tin Shackle-lock.

- 1.** Tag.
- 2.** Pin.
- 3.** Hasp.
- 4.** Padlock.



Fig. 1111. SEAL PRESS.

Fig. 1110. SEAL-HOOK.
(Old style.)

Fig. 1112.

CAR SEAL, with LEAD RIVET-SEAL AND TIN PRINTED SHACKLE.
(Vimped metal.)

Fig. 1113.

Fig. 1114.
TIN SHACKLE AND LEAD
SEAL, with TIN RE-
TURN-TAG.Fig. 1115.
SHEET METAL EYELET
SHACKLE CAR
SEAL.Fig. 1116.
SIX-PLY WIRE SHACKLE
AND LEAD CAR
SEAL.

Fig. 1117.

CENTRAL CAST-IN 'BOW'-
WIRE LEAD SEAL, with
DETECTIVE WIRE.

Fig. 1118.

TWISTED FLAT WIRE
SHACKLE AND LEAD
CAR SEAL.Fig. 1119.
TIN SHACKLE AND
LEAD RIVET-
SEAL.

(For Glass and other Seals see FURNISHINGS, LOCKS.

FURNISHINGS, Seats.

ATS.

CAR-SEATS;
124.

nd, Aisle Seat-
t-end.
nd, Long Seat-
t-end.

est (movable).
ails (fixed).

g, or Side

g.

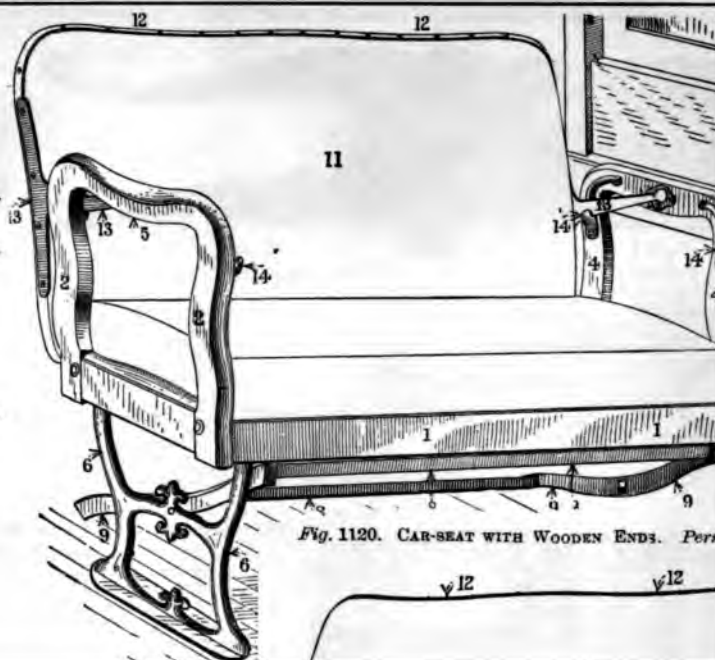


Fig. 1120. CAR-SEAT WITH WOODEN ENDS. Persp

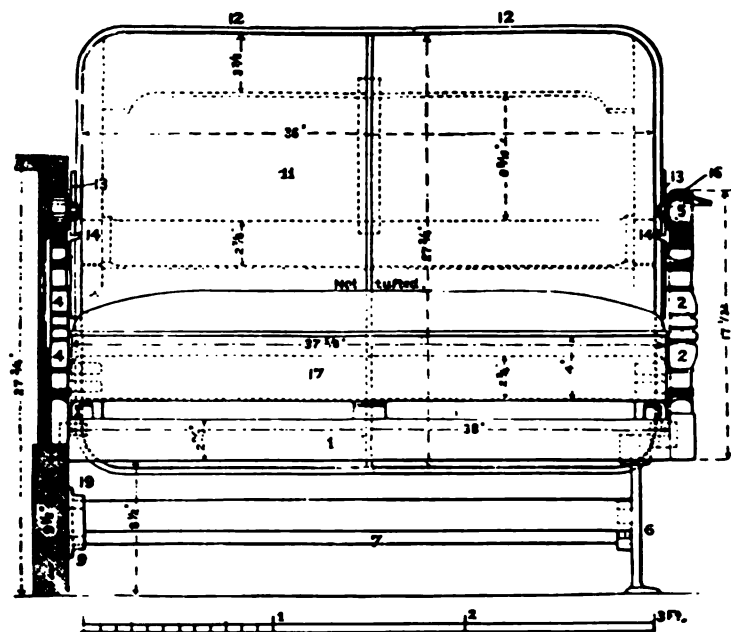


Fig. 1123. Elevation.

MASON ROCKERS CAR-SEAT, Pennsylvania Railroad Standard.

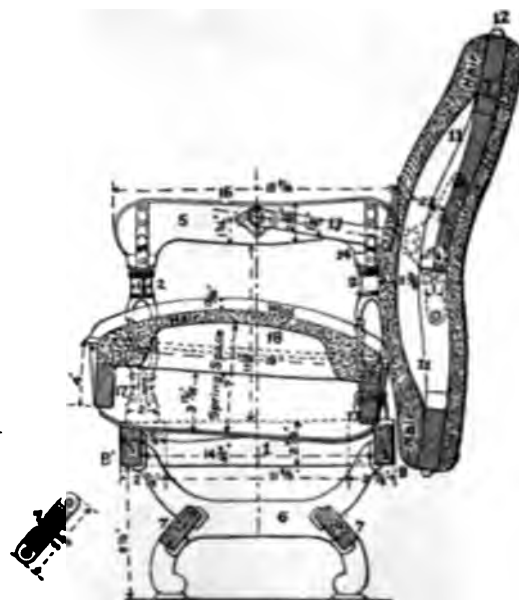


Fig. 1124. Cross Section.

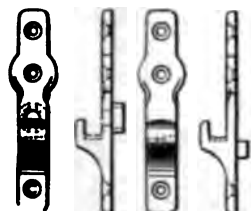


Fig. 1125.

With lock.

SEAT-STOP. (4 1/2-10x3/4 in.)

Fig. 1126.

Without lock.



Fig. 1127.

MASON ROCKERS CAR-SEAT.

Perspective View.

Fig. 1128.

MASON ROCKERS CAR-SEAT.

Perspective View.



Fig. 1129.
SEAT-ARM PLATE.
(2 7/8x1 3/4 in.)



Fig. 1130.
SEAT-ARM PIVOT.
(Hole, 3/4 in. diameter.)

6. FURNISHINGS, Seats.



PERFORATED-VENEER CAR SEAT, with GARDNER'S GEARED SEAT-ARM.



Fig. 1132. CAR-SEAT with COBB'S PIVOT





Fig. 1137. RATTAN CAR-SEAT, "Pullman Standard."



Fig. 1138.

WOVEN-WIRE CAR-SEAT, with springs.



Fig. 1139. PERFORATED-VENEER CAR-SEAT, with BUNTIN'S SEAT-ENDS



Fig. 1139 1/2.

RATTAN CAR-SEAT, without springs.



NAMES OF PARTS; Figs. 1140-1141.

- A. Cushion.
- B. Seat Back.
- C. Track for Rollers.
- D D. Seat-rails.
- E E. Rollers.

ADJUSTABLE ROLLER CAR-SEAT.

Fig. 1140. Perspective View.

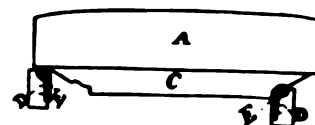


Fig. 1141. Section.

Figs. 1142-1148. FURNISHINGS, Seats.



Fig. 1142.
GARDNER'S GEARED SEAT-ARM, with face
of Seat-arm removed, showing
RACK, PINION, ROCKER
and ROCKER PIVOT.



Fig. 1143.
EMIGRANT CAR-SEAT, with GARDNER'S GEARED SEAT-ARM.



Fig. 1146.
SOFA CASTER, with fixed roller.



Fig. 1147.
CHAIR CASTER, with pivoted roller.



Fig.
RATTAN SPRING-
(Canvas-lined)



Fig. 1148.
RIGID CASTER OR SOCKET.

(By custom of the trade furnishings like Figs. 1145 and 1148 are
although they are, strictly speaking, not such ; not having
rollers. The same is true of Fig. 1545, Table casters.)



URNISHINGS, Seats; *Parlor-car Chairs.*

HARTLEY RECLINING CHAIRS.

NAMES OF PARTS OF HARTLEY
CHAIRS; *Figs. 1154-1158.*

1. *Seat.*
2. *Foot-rest (front and back leaves) carried in a Foot-rest Frame.*
3. *Foot-rest Carrier.*
4. *Drop-rack.*
5. *Back Foot-rest Base (right- and left-hand).*
6. *Back Foot-rest, attached to Back Foot-rest Arm (right- and left-hand).*
7. *Arm (right- and left-hand) carrying Arm-caps.*



HAIR.
(8.)



Fig. 1155. HARTLEY DOUBLE CHAIR.

- | | |
|---|--------------------------------------|
| 8. <i>Rock-shaft Arms (right- and left-hand), attached to Rock-shaft (not shown).</i> | 11. <i>Head-rest.</i> |
| 9. <i>Chair-back.</i> | 12. <i>Pedestal; Base, Co frame.</i> |
| 10. <i>Head-rest Carrier (right- and left-hand).</i> | 13. <i>Chair-leg.</i> |



Fig. 1159.
PARLOR-CAR REVOLVING CHAIR.
(Plush Upholstery.)



Fig. 1160
PARLOR-CAR REVOLVING CHAIR.
("Cane-back" Pattern.)



Fig. 1161
PARLOR-CAR SMOKING CHAIR.
WITH RATTAN OR CANE SEAT.



Fig. 1162.
HORTON RECLINING CHAIR.
(Names of the principal parts are substantially the same as
for the HARTLEY Chair on preceding page.)



Fig. 1163.

OTTOMAN
FOOT-REST



Fig. 1165.
PARLOR-CAR CHAIR.
(Detachable back and seat.)



Fig. 1166
PARLOR-CAR CHAIR, WITH "SPRING-
EDGE" CANE SEAT

Fig. 1164.



FURNISHINGS, Seats; *Seat-arms, Etc.*



SEAT-ARM PIVOT.



Fig. 1168. SOLID-NIPPLE SEAT-ARM PIVOT,
for wooden seat-ends.



Fig. 1169. SOLID-NIPPLE SEAT-ARM PIVOT,
for iron seat-ends.



Fig. 1170. SOLID-NIPPLE SEAT-ARM.
(Creamer's patent.)



Fig. 1171. COBB'S PIVOTED SEAT-ARM
(Shown attached in Fig. 1132.)

- | | |
|---------------------|-----------------|
| 1. Seat-arm Pivot. | 3. Swing-joint. |
| 2. Seat-arm Rocker. | 4. Seat-arm. |



Fig. 1180.
CURVED SEAT-STOP, with LOCK.
(Made right and left hand)

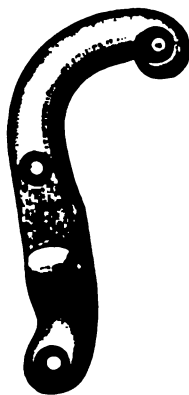


Fig. 1181.
CURVED SEAT-STOP.



Fig. 1182.
SEAT-STOP.



Fig. 1183.
ROUND SEAT-STOP.



Fig. 1184.
ROTTED SEAT-STOP.



Fig. 1187. SEAT-RAIL BRACKET,
for wooden seat-rail.



Fig. 1188. SEAT-RAIL BRACKET,
for iron seat-rail.



Fig. 1185. ARM-REST BRACKET.



Fig. 1186. ARM-REST BRACKET.



Fig. 1190. For Wooden Seat-ends.
A. Tron. C. Slide. D. Guide-bar.



Fig. 1191. For Iron Seat-ends.



Fig. 1189.
SEAT-JOINT BOLT.
(For fastening seat-rail (1, Fig. 1123) to iron seat-ends. Also used at wall end.)

04. FURNISHINGS, Seats; *Seat Ends and Mouldings.*



Fig. 1194.

SEAT FRAME, "QUEEN ANNE" style, with adjustable sliding
FOOT-REST, moving on RABBIT-PIECES.

END.

5.
PLATE.

ARM-CA



Fig. 1205. "FLEXIBLE-TOP" SPRING EDGE SEAT-CUSHION.



Fig. 1206. BURNELL CUSHION-FRAME AND SPIRAL SEAT-SPRINGS.



Fig. 1207. "FLEXIBLE-TOP" SPIRAL-SPRING SEAT-CUSHION, with WEAVING ENDS.



Fig. 1208. WOVEN WIRE SEAT-CUSHION, with SEAT-SPRINGS.



Fig. 1209. ELLIPTIC SEAT-SPRINGS AND CUSHION-FRAME
(A BROAD-BAND Elliptic Seat-spring attached to six slats as in Figs. 1205 and 1207, each carrying four flat elliptic bands, is also manufactured.)



Fig. 1210. WOVEN WIRE SEAT-COVERING.
Showing covering used in Fig. 1208 to about half-size. Standard sizes are about 2½, 3 and 3 meshes per inch.

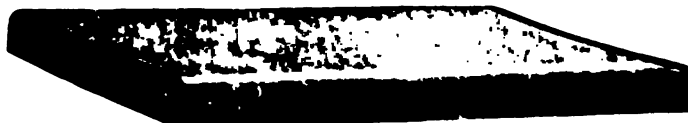


Fig. 1211. RATTAN OR CANE CANVAS-LINED SEAT-CUSHION, without Springs.

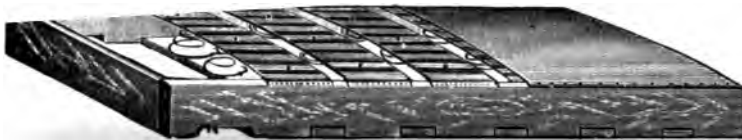


Fig. 1214. "SECTIONAL" SEAT-CUSHION.



Fig. 1216.
"Section" detached of Fig.
1214.

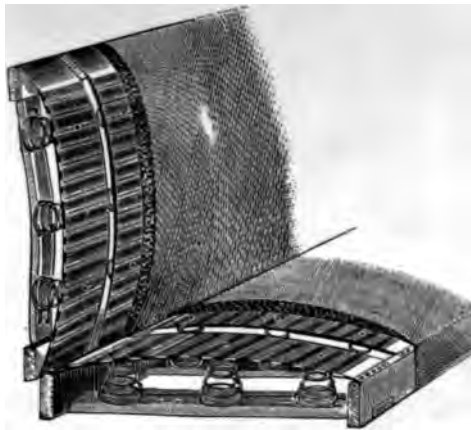


Fig. 1217.
RATTAN OR CANE "SECTIONAL" SEAT AND
BACK; for SIDE-SEATS of Street
and Suburban Cars.



Fig. 12





Fig. 1222.
COBB'S "SECTIONAL" ELLIPTIC SPRING SEAT-CUSHION.



Fig. 1223.
Section, detached, of Fig. 1222.



Fig. 1224.
BROAD-BAND ELLIPTIC SEAT-SPRING.



Fig. 1225.
FELT-EDGE (for finishing the upholstery of cut-seats).

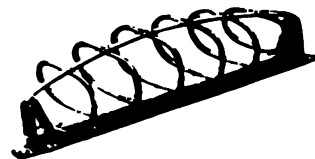


Fig. 1226.
SPIRAL-ELLIPTIC SEAT-SPRING.

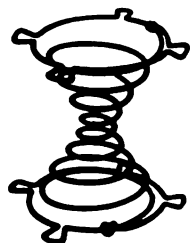


Fig. 1227.
SPIRAL SEAT-SPRING.



Fig. 1228.
KNOTTED SPIRAL SEAT-SPRING.



Fig. 1229.
"KUREKA" SPIRAL SEAT-SPRING.

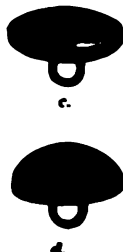


Fig. 1230. SOLID-LEATHER NAILS AND BUTTON.

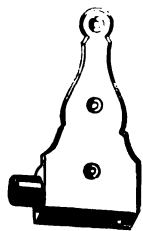


Fig. 1237.
LOOSE BERTH-
HINGE.



Fig. 1238.
LOOSE BERTH-
HINGE BUSHING.

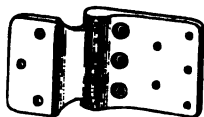


Fig. 1239.
FAST BERTH-HINGE.



Fig. 124
Fogg's UP!
BERTH HIN



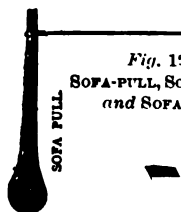
Fig. 1241.
SOFA-PULL, SOFA-CRANK
and SOFA-BOLT.



Fig. 1242.
SOFA-BOLT KEEPER OR
STRIKE-PLATE.



Fig. 1243.
SEAT-PULL.



SAFETY-
ROPE
FASTENER.



SAFETY-
ROPE
HOLDER.



Fig. 1249.
BERTH-SPRING.

1. Berth spring Frame.
2. Berth-spring Frame.
3. Berth-spring Rope.

(Instead of the Rope, 3, a PITCH CHAIN is sometimes used.)



Fig. 1251.
BERTH-SPRING.
Back View.



Fig. 1252.
BERTH-LATCH HANDLE.
1. Berth-latch Face-plate.



Fig. 1253.
BERTH-LATCH BOLT.



Fig. 1254.
BERTH-LATCH KEEPER OR
STRIKE-PLATE.



Fig. 1250.
BERTH-SPRING LUG OR CLIP.

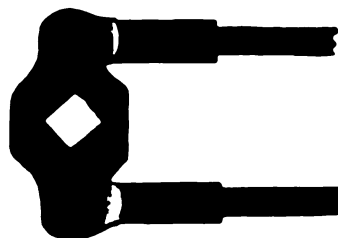


Fig. 1255.
BERTH-LATCH LEVER.
(Operated by the BERTH-LATCH
HANDLE, Fig. 1252.)

(The berth-latch attachments here shown are becoming obsolete in favor of those on the following page.)



Fig. 1256.
MIRROR AND MIRROR-CASE.
(Used between windows in Fig. 678.)



Fig. 1257.
MIRROR-SASH HOLDER.



Fig. 1258.
TRUNK-HOLDER.
(obsolete.)

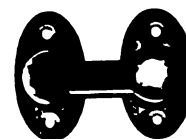


Fig. 1259.
CUPBOARD-CATCH





HOWARD SAFETY BERTH-LATCH.
 (Bolt released by pulling the handle out.)

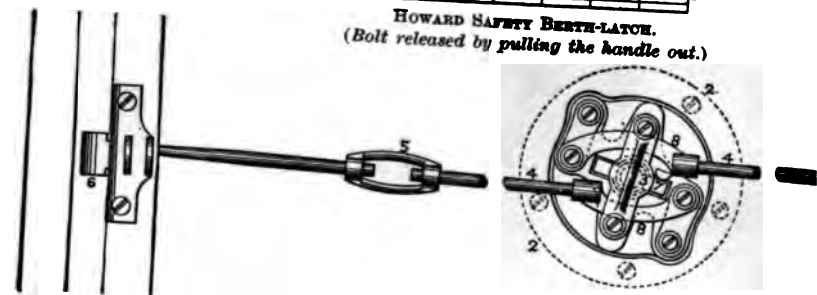




Fig. 1265.
BERTH CURTAIN-ROD
HANGER.



Fig. 1266.
BERTH CURTAIN-HOOK.



Fig. 1267.
BERTH CURTAIN-ROD BOLT
(See Figs. 1265 and 1271.)



Fig. 1268.
BERTH
CURTAIN-HOOK.



Fig. 1269.
BERTH CURTAIN-ROD ACORN.

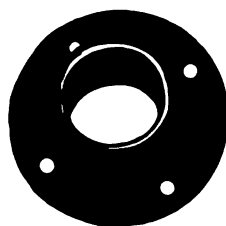


Fig. 1270.
BERTH CURTAIN-ROD BUSHING OR SOCKET.
(Made for 1 in. and 1 1/4 in. rods.)



Fig. 1272.
COMBINED VENTILATING REGISTER AND BERTH CURTAIN-
ROD BRACKET.
1. Berth Curtain-rod Coupling.
2. Hat-post.
(For other Ventilators, see Figs. 1553-60.)



Fig. 1271.
BERTH CURTAIN-ROD BRACKET.
1. Berth Curtain-rod Bolt.
2. Berth Curtain-rod Coupling.
3. Hat-post.



Fig. 1273.
BERTH CURTAIN-ROD
TIP, OR ACORN.



Fig. 1274.
BERTH CURTAIN-ROD BUSHING, OR SOCKET.

Fig. 1275.
HEAD-BOARD
COUPLING.

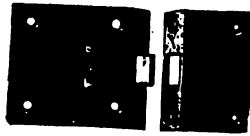


Fig. 1276.
HEAD-BOARD
COUPLING KEEPER.

Fig. 1277.
HEAD-BOARD RACK-CATCH AND KEEPER
OR STRIKE-PLATE.

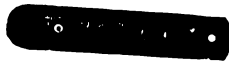


Fig. 1280.
HEAD-BOARD BUSHINGS.



Fig. 1278.
HEAD-BOARD BOLT AND BUSHING.
1. *Upper Face-plate.*
2. *Knob-latch.*
3. *Lower, or Fixed Bolt.*
4. *Slide-latch.*
5. *Lower Face-plate.*
6. *Bolt-spring.*
7. *Upper, or Spring-bolt.*



Fig. 1283.
HEAD-BOARD BOLT.



FURNISHINGS, Sleeping-Car; Emigrant.

Figs. 1285-1290

The reference letters refer to Figs. 682 685 and 1149-1153, where the furnishings are shown attached.



Fig. 1285.
END BERTH-REST (N).

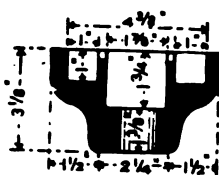


Fig. 1286. Section.

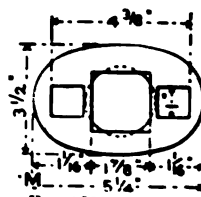


Fig. 1287. Plan.



Fig. 1291.
BERTH-CATCH COMPLETE (H).

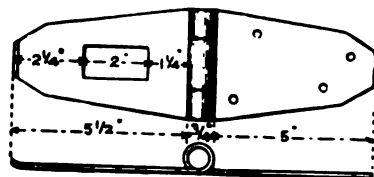


Fig. 1288.
BERTH-HINGE (A).

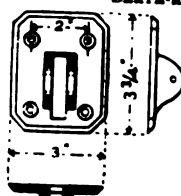


Fig. 1289.
BERTH-CATCH (H).



Fig. 1290.
HOOK FOR BERTH-CATCH.

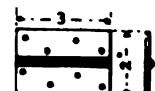


Fig. 1292.
SEAT-HINGE.

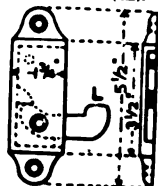


Fig. 1293.
UPPER-BERTH REST (K) for leaning
upper berth partially open.
(K to touch L).

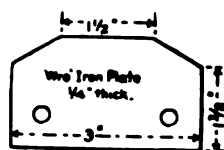


Fig. 1294.
STOP-BAR PLATE.
(Secured underneath of S to support
Stop-bar.)

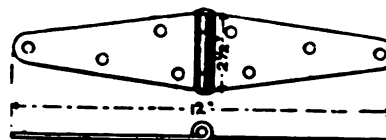


Fig. 1295.
STOP-BAR HINGE (A)

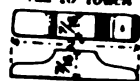


Fig. 1296.
STOP-BAR GUIDE.



Fig. 1297.
BERTH-STOP.
(Carried on upper berth at K.)

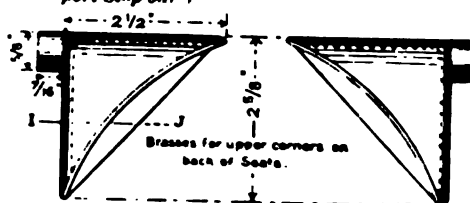


Fig. 1298.
SEAT-BACK CORNER.
Section at I J.

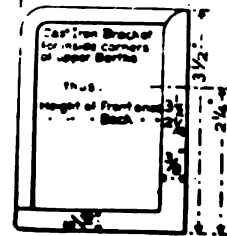
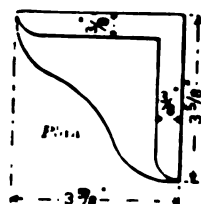
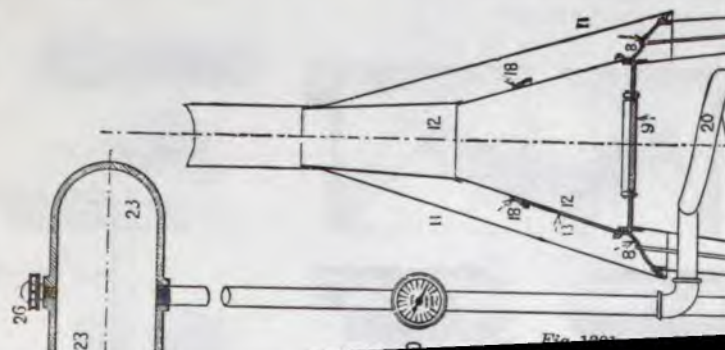


Fig. 1299. Elevation
SEAT-BACK CORNER-BRACKET.



Fig. 1300. BAKER HEATER. Persp

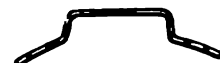


BAKER HEATER.

NAMES OF PARTS OF BAKER HEATER; Fig. 1301.

(Numbers in parentheses refer to the figures giving separate views of the same parts.)

- | | | | |
|--------------------|--------------------------|------------------------------------|-------------------------------------|
| 1. Bottom-plate. | (1302) 8. Cast-iron Top. | (1309) 16. Rocking-bar, for Grate. | 23. Circulating-drum. (1325) |
| 2. Ash-pit. | (1303) 9. Safety-grate. | (1310) 17. Ring, for Smoke-top. | (1317) 25. Combination-cock. (1328) |
| 3. Grate. | (1304) 11. Heat-guard. | (1312) 18. Ring, for Smoke-top. | 26. Safety-valve. (1322) |
| 4. Fire-pot. | (1305) 12. Smoke top. | (1313) 19. Filling-funnel. | (1319) 28. Filling-funnel. (1323) |
| 5. Inside-casing. | (1306) 13. Feed-floor. | (1314) 20. Coil. | (1321) 30. Pressure-gauge. (1324) |
| 6. Outside-casing. | (1307) | | |

Fig. 1302.
BOTTOM STOVE-PLATE.Fig. 1306.
INSIDE-CASING.Fig. 1310.
SAFETY-GRATE.Fig. 1314.
FEED-DOOR.Fig. 1318.
ASH-PIT-DOOR HANDLE.Fig. 1303.
ASH-PIT.Fig. 1307.
OUTSIDE-CASING.Fig. 1311
SAFETY-GRATE SPRING.Fig. 1315.
FEED-DOOR HANDLE.Fig. 1304.
GRATE.Fig. 1308.
ASH PIT DOOR.Fig. 1312.
HEAT-GUARD.Fig. 1316.
SAFETY-GRATE LATCHFig. 1319.
RING FOR SMOKE-TOP.Fig. 1305.
FIRE-POT.Fig. 1309.
CAST-IRON TOP.Fig. 1313.
SMOKE-TOPFig. 1317.
ROCKING-BAR FOR GRATE.Fig. 1320.
GRATE-SHAKER.Fig. 1321.
COIL.Fig. 1322.
SAFETY-VALVE.Fig. 1323.
FILLING-FUNNEL.Fig. 1324.
PRESSURE-GAUGE.

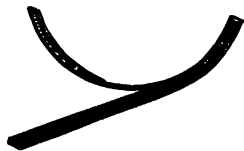


Fig. 1327.
DRUM-SUPPORT.



Fig. 1328.
COMBINATION-COCK.



Fig. 1329.
SAFETY-VALVE BALL.



Fig. 1332.
PIPE-SUPPORT.



Fig. 1333.
SINGLE PIPE-CLIP.



Fig. 11.
ELBO



Fig. 1336.
RADIATOR-STAND.



Fig. 1337.
CLOSE RETURN-BEND.



Fig. 13.
REDUCING-



Fig. 1340.
RADIATOR-STAND.



Fig. 1341.
OPEN RETURN-BEND.



Fig. 134.
NIPPLE



BISSELL HEATER.

The heaters as respects size are distinguished by the makers as Nos. 4 and 5, and as respects air-supply and manner of heating as follows:

- A. Plain Stove, Fig. 1349.
- B. External-air Supply, as in Fig. 1351 at top.
- C. External Supply, as at top of Fig. 1351, with sheet-iron hot-air flue passing under the seats. Flue shown at bottom of Fig. 1351.
- D. Cold air enters from the side at bottom of stove; otherwise same as C.

All of the above eight styles are furnished either with or without the safety water-base attachment shown in Fig. 1350.

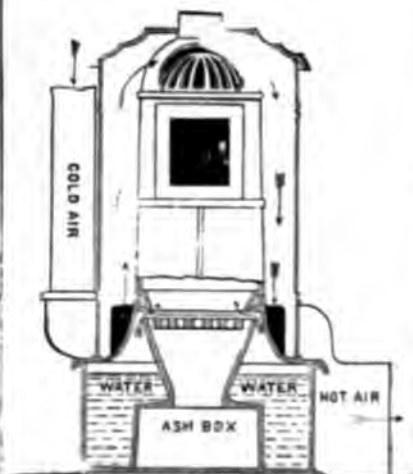


Fig. 1350.

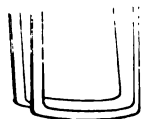
Vertical Section, showing SAFETY WATER-BASE.



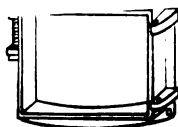
Fig. 1349.
PLAIN STOVE,
No. 5 A,
without safety
water-base.



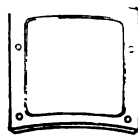
Fig. 1351
SAFETY STOVE,
No. 4 C,
with safety
water-base.



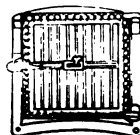
5
Fig. 1356.
FEED-DOOR
CHUTE.



6
Fig. 1357.
ASH-PIT DOOR-
FRAME.



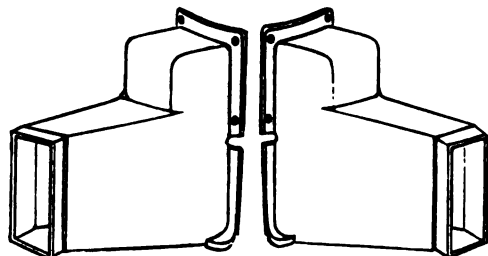
7
Fig. 1358.
AIR-CONDUCTOR
FRAME.



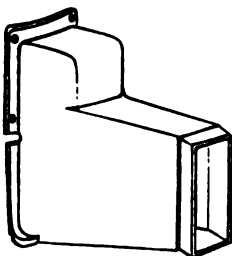
8
Fig. 1359.
FEED-DOOR AND
FRAME.



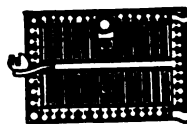
Fig.
1361
Fire-Cha
Sec



14
Fig. 1363.
HEAT-CONDUCTOR.
(Right.)



16
Fig. 1364.
HEAT-CONDUCTOR.
(Left.)



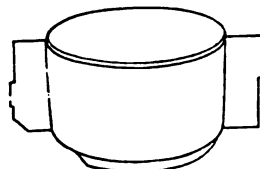
17
Fig. 1349. ASH-PIT DOOR.



18
Fig. 1365.
FEED-DOOR
REGISTER.



20
Fig. 1367.
GRATE AND GRATE
REST.



23
Fig. 1371. FIRE-CHAMBER
(Lower Section.)

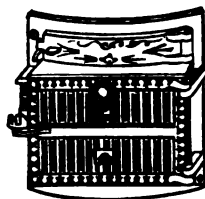


Fig. 1374.

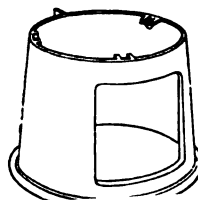
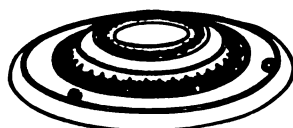
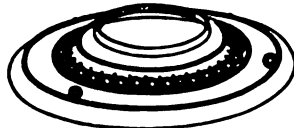


Fig. 1375

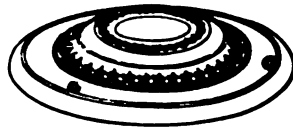
DETAILS OF No. 4 BISSELL HEATER.



1
Fig. 1378.
OUTSIDE TOP.



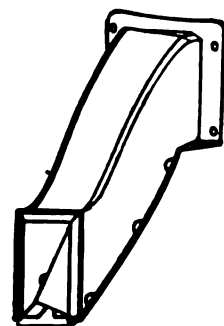
2
Fig. 1379.
OUTSIDE TOP for Centre
Cold-air Pipe.



3
Fig. 1380.
OUTSIDE TOP for Baggage-
car Stove.



4
Fig. 1381.
CASTING-RING.



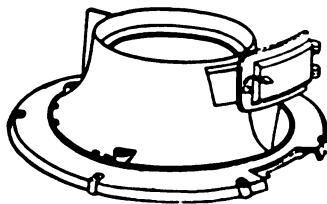
5
Fig. 1382.
HEAT-CONDUCTOR (Right).



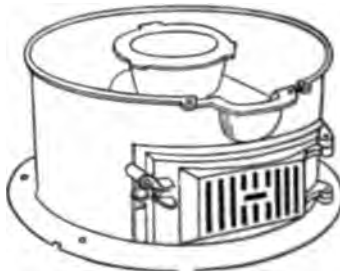
6
Fig. 1383.
INSIDE PER-
FORATED-TOP.



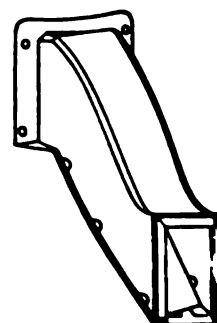
7
Fig. 1384.
CAP FOR
WATER-BOTTOM.



8
Fig. 1385.
WATER-BOTTOM DOOR.



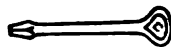
9
Fig. 1386.
WATER-BOTTOM, with Ash-door.



10
Fig. 1387.
HEAT-CONDUCTOR (Left).



11
Fig. 1388.
SPRING-
LOCK HANDLE.



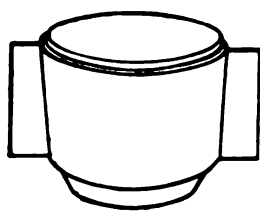
12
Fig. 1389.
SHAKER-
HANDLE.



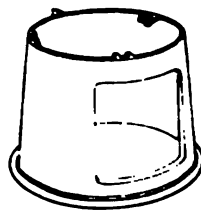
13
Fig. 1390.
GRATE AND GRATE-
REST.



14
Fig. 1391.
FIRE-DOOR REGISTER.



15
Fig. 1392.
FIRE-CHAMBER (Lower
section).



16
Fig. 1393.
FIRE-CHAMBER (Middle
section).



17
Fig. 1394.
CLIPPER-DOOR AND
DOOR-FRAME.



18
Fig. 1395.
SPRING
LOCK.



19
Fig. 1396.
CLIPPER-DOOR AND
DOOR-FRAME.



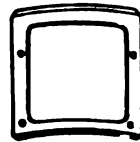
20
Fig. 1397.
AIR-REGISTER for Bag-
gage-car Stoves.



21
Fig. 1398.
FIRE-DOOR FRAME.



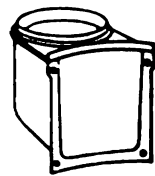
22
Fig. 1399.
FIRE-DOOR AND
FRAME.



23
Fig. 1400.
AIR-CONDUCTOR
FRAME.



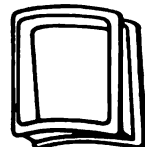
24
Fig. 1401.
FIRE-CHAMBER
(Top section).



25
Fig. 1402.
COLD-AIR CON-
DUCTOR.



26
Fig. 1403.
FUNNEL.



27
Fig. 1404.
FIRE-DOOR
CURTAIN.

(The numbers immediately below the figures are the same as used in the makers' lists.)



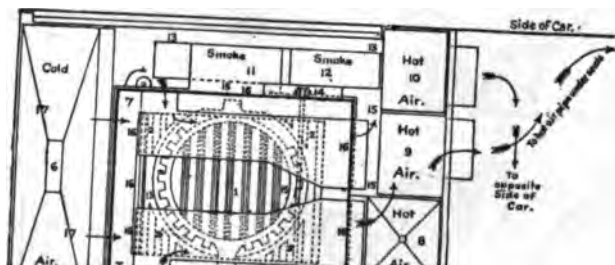
Fig. 1405. Outside View.

Figs. 1405-1407.

(Figures in parentheses give the number which the same part has in the cuts of details, Figs. 1413 to 1471.)

1. Movable Grate (5).
2. Fixed Grate (4) lying under the Radiator, 16 (99).
3. Damper-rod (89).
4. Top of Mouth-piece (87).
5. Entrance to Radiator (99).

GOUGE "VENTILATOR" HEATER.



6. Cinder-tray Injector air, 17 cinders e through Roof Air
- 7-7. Opening into heat near floor
8. Deflector-pi discharge



Fig. 1408.

Gouge "VENTILATOR" HEATER.

Corner of car at opposite end from heater, showing DEFLECTING OUTFLOW for fresh air and EXHAUSTING WEATHER-CAP and VENTILATING DAMPER at top.

NAMES OF PARTS: Figs. 1408-1412.

- | | |
|--------------------------------|----------------------------|
| 10. Cast-iron Front. | 80. Injector-end of Case. |
| 12. Feed-door Stop. | 81. Back of Case. |
| 21. Dust-door. | 82. Deflector-end of Case. |
| 22. Draft-door (L. H.). | 83. Bottom of Case. |
| 23. Draft-door (R. H.). | 84. Deflector Valve. |
| 61. Front-hining. | 85. Front-offset. |
| 77. Injector Connecting-joint. | 86. Back-offset. |
| 78. Smoke Connecting-joint. | 87. Front of Case. |
| 79. Top of Case. | 88. Name-plate. |
| | 89. Chain-plate. |
| | 90. Radiator. |



Fig. 1408 1/2. CAST-IRON FRONT.



Fig. 1409. BACK OF CASE.



Fig. 1410. FRONT-LIVING.



Fig. 1411. RADIATOR.

(The reference numbers are the same as used in the makers' lists.)

Fig. 1412



Fig. 1413.

- 30. Smoke-bos.
- 32. Back Smoke-collar.
- 56. Injector-pipe.
- 58. Long Smoke-pipe.
- 59. Short Smoke-pipe.
- 75. Injector-valve.



Fig. 1414.

- 52. Fire-bos.
- 53. Deflector-pipe.
- 54. Front Hot-air Pipe.
- 55. Back Hot-air Pipe.
- 56. Injector-pipe.
- 57. Cold-air Elbow.
- 58. Long Smoke-pipe.
- 76. Injector-pipe Valve-chain.



Fig. 141.

- 14. Feed-disk.
- 73. Injector.



Fig. 1422.
CROSS-BAR.



Fig. 1423.
BASE-BAND.



Figs. 1424-5.
LINING-GUARD.



Fig. 1429.
END LINING.



Fig. 1426.
SMOKE-PIPE
TRIMMELS.



Fig. 1427.
DEAD-PLATE.

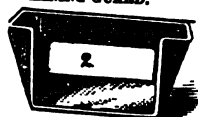


Fig. 1428.
ASH-PIT.



Fig. 1430.
BALL AND CHAIN.



Fig. 1493.
CROSS-BAR BACK REST.



Fig. 1444.
8. Cross-bar Front Rest.
98. Shield-foot.



Fig. 1445.
GRATE-SLIDE.



Fig. 1446.
35. Grate-slide Rests.
36. Wrench.



Fig. 1447.
90. Upper Deflector.
91. Upper Deflector Guard.



Fig. 1448.
INSIDE MOUTH-PIECE.



Fig. 1449.
BACK SMOKE-COLLAR.



Fig. 1450.
FIRE-DOOR.



Fig. 1451.
FIRE-DOOR LINING.



Fig. 1452.
MOVABLE GRATE.



Fig. 1453.
TOP SMOKE-COLLAR.



Fig. 1454.
DAMPER-FRAME.



Fig. 1455.



Fig. 1456.

- 38. Damper.
- 39. Damper-rod.
- 40. Damper-knob.
- 42. Damper-clip.



Fig. 1457.
LOWER DEFLECTOR-FRAME.



Fig. 1458.
LOWER DEFLECTOR.



Fig. 1459.
GRATE FRAME.



Fig. 1460.
DRAFT-DOOR CATCH.



Fig. 1461.
GRATE-REST.



Fig. 1462.
INLET ELBOW.



Fig. 1463.
SMOKE-BOX.



Fig. 1464.
SHIELD.



Fig. 1467.
DRAFT-DOOR SLIDE.



Fig. 1468.
SMOKE-BOX DOOR.



Fig. 1469.

11. Cast-iron Binder.
99. Cord and Tassel.



Fig. 1470.
END-JOINT OF RUNNING-PIPE.



Fig. 1471.
BACK RUNNING-PIPE.

(The reference numbers are the same as in makers' lists.)

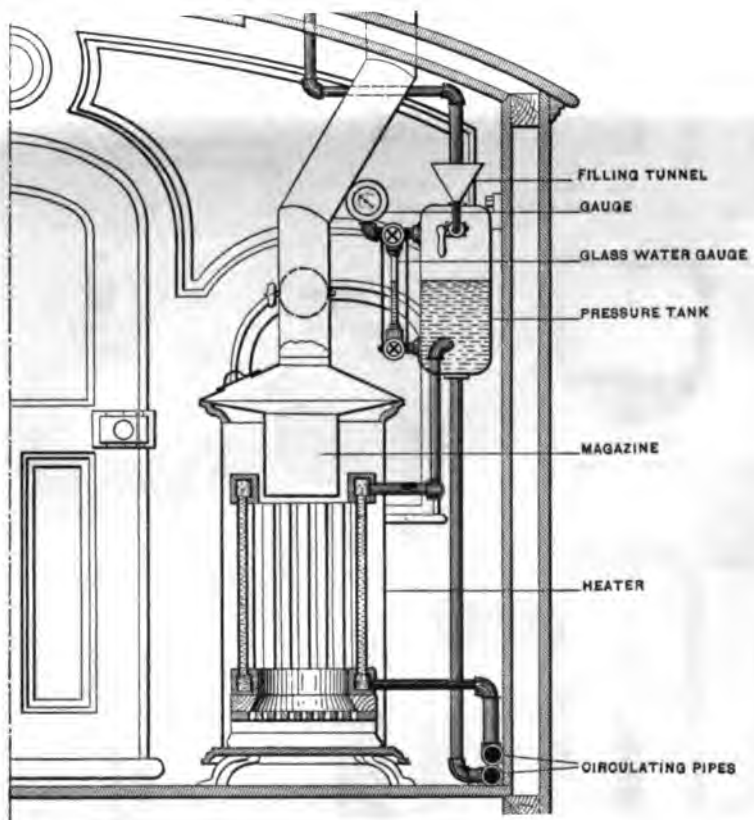




Fig. 1473. Outside View.

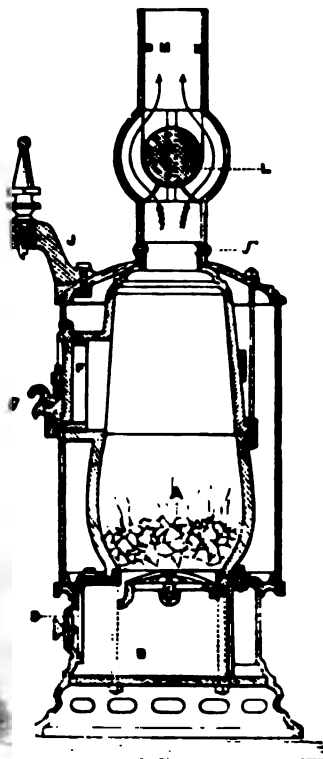


Fig. 1474. Section.

KOHLER STOVE.
(Hard or Soft Coal.)

NAMES OF PARTS; Figs. 1473-1474.

- A. Fire-pot.
- B. Ash-pit.
- D. Ash-pit Door.
- E. Spring-catch, for Ash-pit Door.
- F. Feed-door.
- G. Spring-lock, for Feed-door.
- J. Spring-catch, for Feed-door.
- L. Safety-ball.
- M. Safety-ball Lugs.

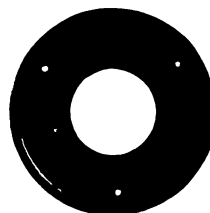
Fig. 1475.
HOWARD STOVE.Fig. 1476.
CYLINDRICAL STOVE.Fig. 1477.
STOVE-PIPE RING.Fig. 1478.
CHILD'S STOVE.Fig. 1479.
CAST-IRON (EGG-SHAPED) STOVE.



Fig. 1480.
HOTEL-CAR RANGE,
with broiler and hot-water tank.
Size, 3 ft. 4 in. \times 2 ft. 1 in. \times 5 ft. 6 in.
Weight, 725 lbs.

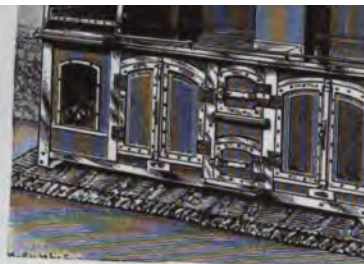


Fig. 1481.
DINING-CAR RANGE,
with broiler, hot-water tank and fuel
Size, 6 ft. 0 in. \times 2 ft. 10 in. \times 5 ft. 6 in.
Weight, 1,250 lbs.



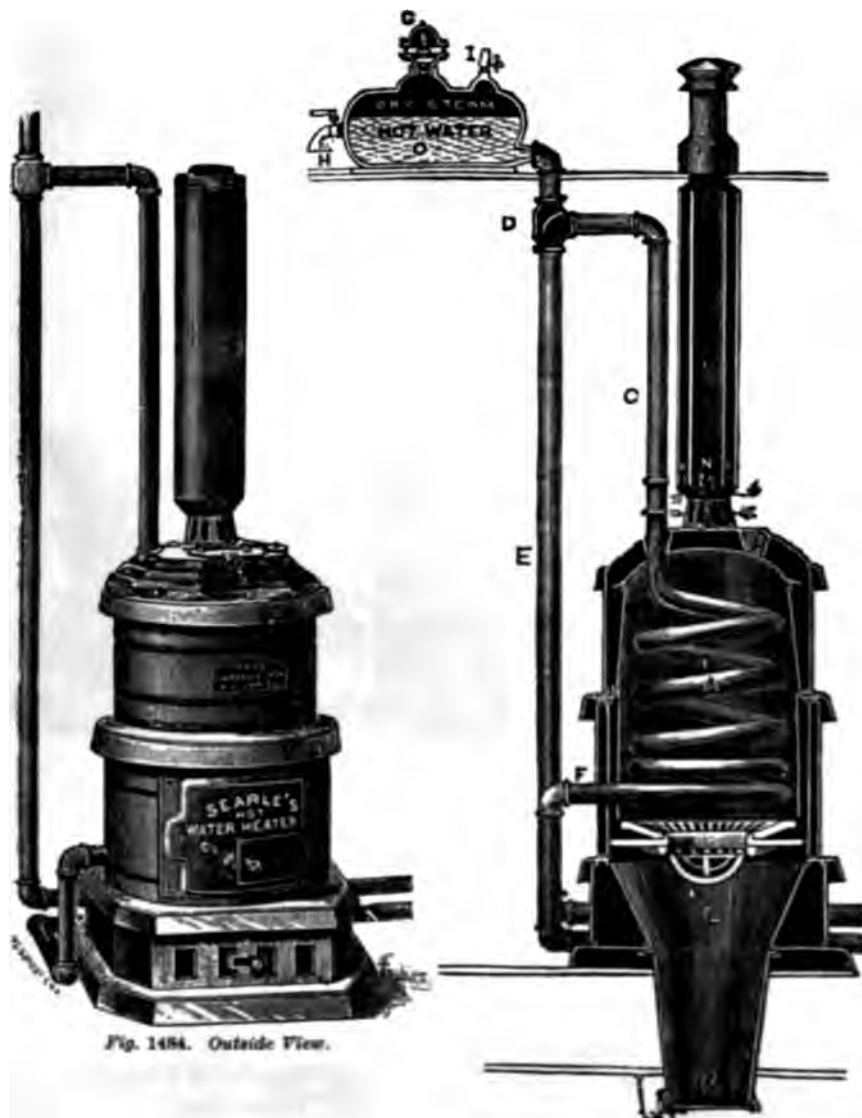


Fig. 1484. Outside View.

Fig. 1485. Section.

SEARLE HOT-WATER HEATER.**SEARLE HOT-WATER HEATER.**

NAMES OF PARTS; Figs. 1484-1485.

- A. Coil.
- B. Outlet.
- C. Outflow-pipe.
- D. Deflector.
- E. Delivery-pipe.
- F. Cold Feed-pipe.
- G. Safety-valve.
- H. Waste-cock.
- I. Feed-cock.
- J. Outflow-pipe Passage.
- K. Smoke-pipe Casing.
- L. Ash-pit.
- M. Ash-dump.
- N. Store-pipe.
- O. Expansion-drum.

Near
K { Pipe-collar Register.

Near C,
not
shown
in cut. { Cut-off Valve.

(Names of parts not shown in the above figures and list are substantially the same as similar parts of other hot-water heaters.)

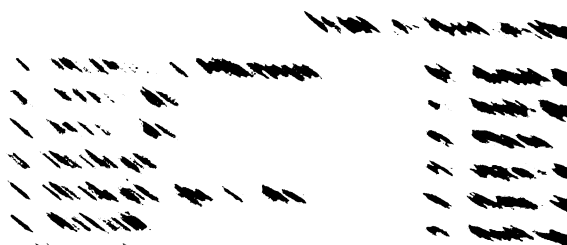




Fig. 1490.
ANTI-CLIMBER CAR-HEATER.
Section.

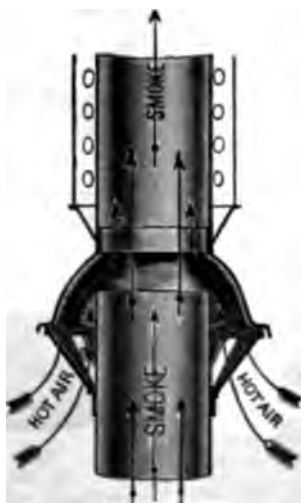


Fig. 1491.
HEAT AND DRAFT REGULATOR.
for A and D Stoves.



Fig. 1492.
A STOVE, with HEAT AND DRAFT REGULATOR.



Fig. 1493.
INSIDE TOP-PLATE, for Stoves A and B.
Collar in the centre.



Fig. 1494.
(2). OUTSIDE TOP-PLATE, for Stove C.
Collar in the centre.



Fig. 1495.
(3). OUTSIDE TOP-PLATE, for Stove D.
Collar in the centre.



Fig. 1496.
(4). VALVE FOR TOP-PLATE, for Stove C.



Fig. 1497.
(5). INSIDE TOP-PLATE, for Stoves A, B, C
and D. Collar in the Centre.

(The reference numbers in parentheses are the same as used in the makers' lists.)

FURNISHINGS, Stoves and Heaters ; *Spear Heater.*

SPEAR HEATER.

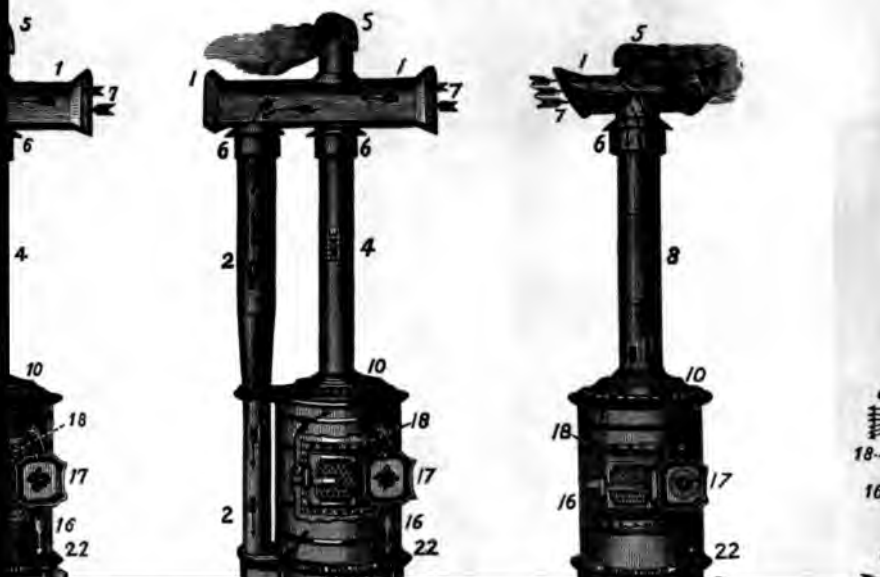




Fig. 1490.
SPEAR ANTI-CLINKER CAR-HEATER.
Section.



Fig. 1491.
HEAT AND DRAFT REGULATOR,
for A and D Stoves.



Fig. 1492.
A STOVE, with HEAT AND DRAFT REGULATOR.



Fig. 1493.
(1). OUTSIDE TOP-PLATE, for Stoves A and B.
Collar in the centre.



Fig. 1494.
(2). OUTSIDE TOP-PLATE, for Stove C.
Collar in the centre.



Fig. 1495.
(3). OUTSIDE TOP-PLATE, for Stove D.
Collar in the centre.



Fig. 1496.
(4). VALVE FOR TOP-PLATE, for Stove C.



Fig. 1497.
(5). INNER TOP-PLATE, for Stoves A, B, C
and D. Collar in the Centre.

(The reference numbers in parentheses are the same as used in the makers' lists.)

FURNISHINGS, Stoves and Heaters; Spear Heater.



(7)
Fig. 1499.
ASH-PIT BASE, for stoves
A, B, C and D.



(8)
Fig. 1500
BOTTOM STOVE-PLATE, for stoves
A, B, C and D.



(11)
Fig. 1502.
FIRE-DOOR AND DOOR-FRAME,
for stoves A, B, C and D.



(10)
Fig. 1503.
INSIDE RING, for stoves
A, B, C and D.



Top Sect. of
Cylinder.

Middle Sect.
Cylinder.

Lower Sect.
Cylinder.

Stoves
A, B, C and D.

Fig.
BACK BASE-
for stoves

Fig.
FIRE-DOOR F
A, B,



Fig. 1515.
(34.) OUTSIDE TOP-PLATE,
for Stove C. Collar set back.



Fig. 1516.
(25.) OUTSIDE TOP-PLATE,
for Stove D. Collar set back.



Fig. 1517.
(26.) INSIDE TOP-PLATE,
for Stoves A and B. Collar
set back.



Fig. 1518.
(27.) INSIDE TOP-PLATE,
for Stoves C and D. Collar
set back.



Fig. 1519.
(28.) FIRE POT,
for Stoves A, B, C and D. Collar set back.

Top Section of
Cylinder.

Middle Section
of Cylinder.

Lower Section
of Cylinder.



Fig. 1520.
(29.) BACK DIVISION-STRIPS,
for Stoves A and B.



Fig. 1521
(30.) FRONT DIVISION-STRIPS,
for Stoves A and B.



Fig. 1522.
(31.) OUTSIDE BURNER-IRON CASING,
for Stoves A, B, C and D.



Fig. 1523.
(32.) CAST-IRON HOT-AIR ELBOW AND BOX,
for Stove A.



Fig. 1524.
(33.) FIRE-PROOF BOTTOM,
for Stoves A, B, C and D.



Fig. 1525.
(34.) STOVE-PIPE RINGS,
for Cylind of Cars.



Fig. 1526.
(35.) VENTILATOR OR WIND-SCOOP,
for Stoves A and B.



Fig. 1527.
(36.) VENTILATOR OR WIND-SCOOP,
for Stove C.



Fig. 1528.
(37.) STOVE-PIPE CAP,
for Stove D.



Fig. 1529a.
GRATE.



Fig. 1529b.
GRATE-PIECE.



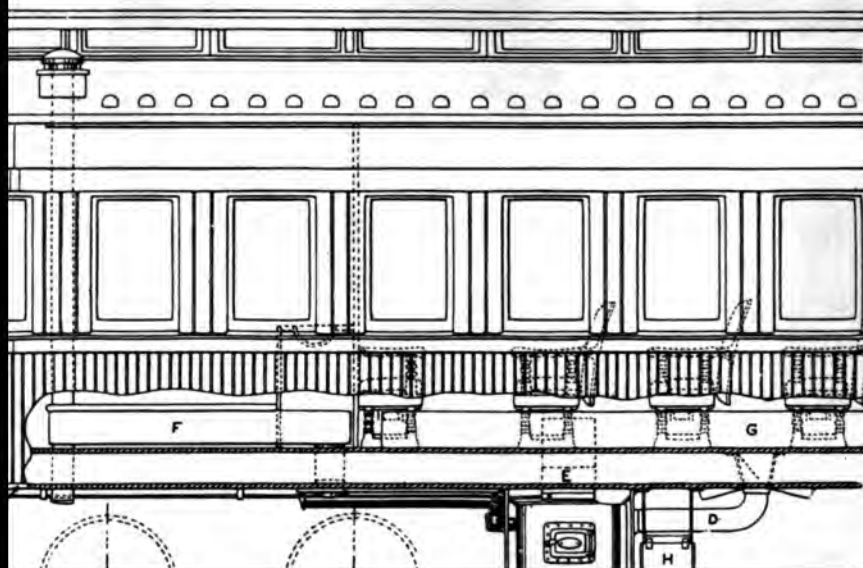
Fig. 1530.
FORD-HOLE FUNNEL.



Fig. 1531.
DOUBLE FIRE-DOOR.

(The reference numbers in parentheses are the same as used in the makers' lists.)

NGS, Stoves and Heaters; *Suspended Heater.*



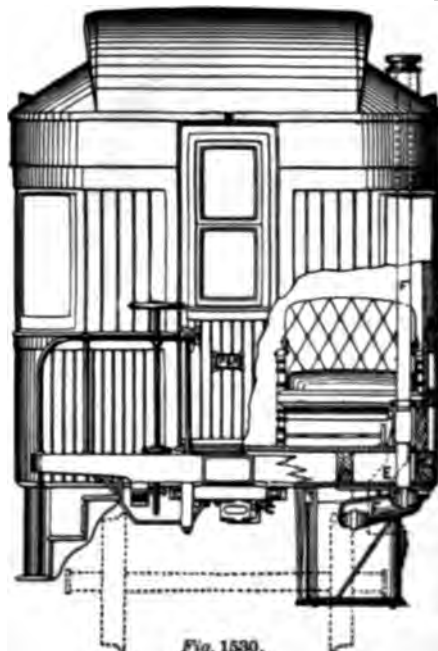


Fig. 1530.

End Elevation of Sound-ended Car with Heater.
SUSPENDED CAR HEATER, PHILADELPHIA & READING RAILROAD.

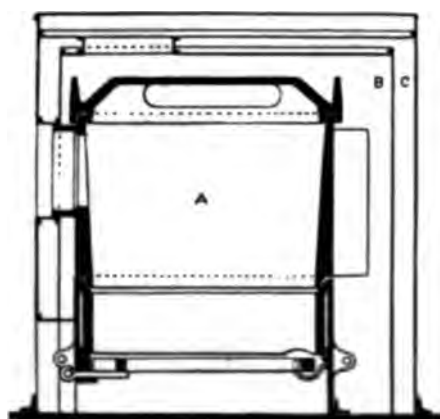


Fig. 1531. Longitudinal Section.
 (Transverse in respect to the car.)

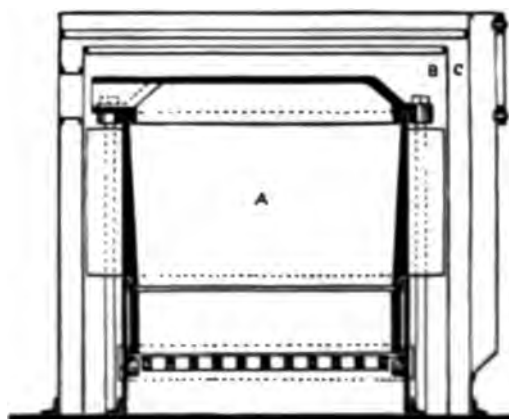


Fig. 1532. Transverse Section.
 (Longitudinal in respect to the car.)

FURNISHINGS, Stoves and Heaters; *Winslow Heater.*

WINSLOW HEATER.





Fig. 1536
WINSLOW HEATER,
With CASING or JACKET removed.

NAMES OF PARTS: Fig. 1536.

A. *Safety-tank* (holding 16 gallons of water).

B. *Fire-pot*.

C C. *Safety-pipes*, leading from safety-tank into fire-pot.

D. *Discharge-cock*.

F. *Filler*.

G. *Dome*.

H. *Ash-pit*.



Fig. 1535.
WINSLOW HEATER, No. 2.



Fig. 1537.
WINSLOW HEATER, No. 2. Fire-top.

FURNISHINGS, Table, Etc.



Fig. 1540.
CASTER HOLDER.
(17 × 4 in.)



Fig. 1541.
CASTER-HOLDER.
(7½ × 3 in.)



Fig. 1542.
CASTER-HOLDER.



Fig. 1545.
RIGID CASTER, for tables.



Fig. 1553.
FRIED'S-VENTILATOR REGISTER.
1. Register-handle.
2. Register-frame.
3. Register-valve.
4. Register-face.



Fig. 1554.
VENTILATOR-DOOR.

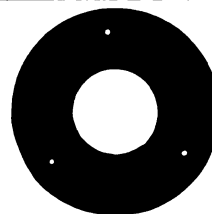


Fig. 1555.
VENTILATOR-RING.



Fig. 1557.
AUTOMATIC VENTILATOR.
1. Ventilator-deflector.
2. Ventilator-hood.

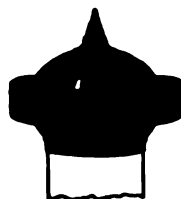


Fig. 1558.
Perspective View.

"GLOBE" VENTILATOR.



Fig. 1559.
Section.



Fig. 1560.
FULL-HOOK OR DUCK-CAKE OPENER.
(3 ft. long.)



Fig. 1560.
Inside View.



Fig. 1561.
Outside View.

"KROHLER" VENTILATOR.
(See also VENTILATOR-JACK in Figs. 1092-1094, and in FURNISHINGS; STOVES AND HEATERS.)

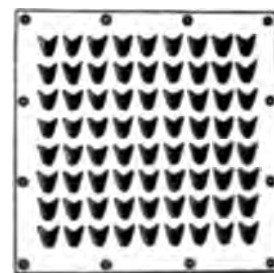


Fig. 1562.
FRIED'S VENTILATOR-PLATE.



Fig. 1563.

Figs. 1564-1569. FURNISHINGS, Ventilators.



*Fig. 1564. Inside View.
'EUREKA' VENTILATOR.*

NAMES OF PARTS, "EUREKA" VENTILATOR; *Figs. 1564-1565.*

- A. Air-passage.
- B. Air-inlet.
- D. Deflectors.
- E. Hood.



*Fig. 1565. Section
'EUREKA' VENTILATOR
(1-6 full size; for openings,
8x8".)*

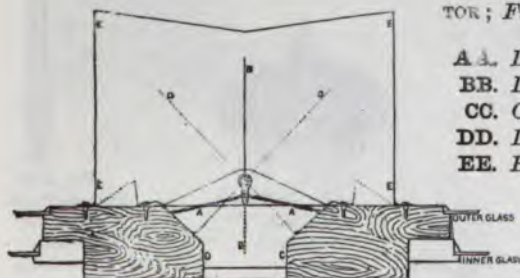


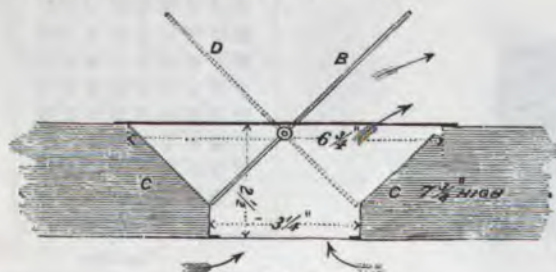
Fig. 1566.

CREAMER'S AUTOMATIC VENTILATOR.

(For openings, $3\frac{3}{4} \times 7\frac{1}{4}$ " and 8x8". Outside appearance similar to Fig. 1569, or, without hood, to Fig. 1567.)

NAMES OF PARTS, CREAMER AND "STANDARD" VENTILATOR; *Figs. 1566 and 1568.*

- A. Deflector-springs.
- BB. Deflector.
- CC. Casing.
- DD. Deflector (in action).
- EE. Hood.



*Fig. 1568.
'STANDARD' AUTOMATIC VENTILATOR.*



*Fig. 1567.
ROOF VENTILATOR.*



*Fig. 1569.
VENTILATOR-HOOD.
1. Deflector. 2. Hood.*



Fig. 1570. WATER TANK AND SINGLE-ACTING PUMP.
Front removed.

NAMES OF PARTS: Figs. 1570-71.

1. Tank.
2. Wash-basin.
3. Slab.
4. Basin-pump Handle.
5. Basin-pump Nozzle.
6. Soap Dish.
7. Mirror.
8. Basin-pump Lever.
9. Basin-pump Post.
10. Basin-pump Case.
11. Basin-pump Pipe.
12. Basin-pump Strainer.
13. Basin-pump Rod.



Fig. 1571.
WASH-ROOM BASIN-PUMP (Double-acting).

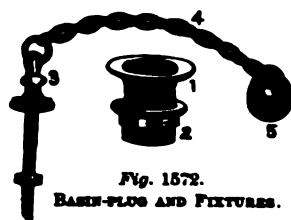


Fig. 1572.
BASIN-PLUG AND FIXTURES.



Fig. 1573.
WASTE-COCK
SPIDER



Fig. 1574.
TANK
WASTE-COCK.



Fig. 1575.
TANK
WASTE-COCK
WRENCH

1. Basin-coupling, or Drip-coupling.
2. Basin Chain-holder.
3. Basin-chain.
4. Basin-plug.



Fig. 1576. SOAP-HOLDER (Old Style).



Fig. 1580.
BASIN-PLUG AND
CHAIN-HOLDER.



Fig. 1579 1/2. SOAP-HOLDER.



Fig. 1576.
TUMBLER-HOLDER,
Double.



Fig. 1577.
TUMBLER-HOLDER,
Single.



Fig. 1579. SOAP-DISH.

FURNISHINGS, Wash-room.



Fig. 1581. MIRROR-GUARD AND BRUSH AND COMB HOLDER. ($19\frac{1}{4} \times 5 \times 2\frac{1}{4}$ in.)



AND COMB RACK.
(little used.)



Fig. 1583. TOWEL RACK. ($19 \times 4\frac{1}{4}$ in.)





Fig. 1501.
SELF-CLOSING FAUCET.

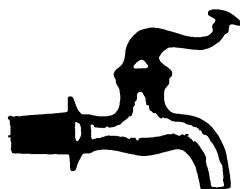


Fig. 1502.
HORIZONTAL TELEGRAPH-COCK
OR FAUCET.



Fig. 1503. BIRD-COCK.

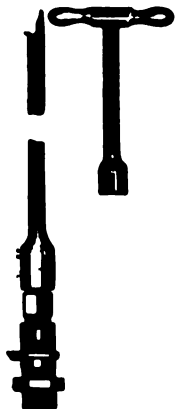


Fig. 1507.
WATER-COOLER VALVE,
with SOCKET and
WRENCH.
(1-5 full size.)

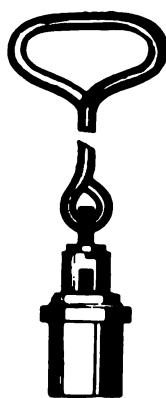


Fig. 1509.
TANK-VALVE,
with WRENCH.
(1-5 full size.)



Fig. 1504. WATER-ALCOVE.
(Size, $13\frac{1}{4} \times 8\frac{1}{4} \times 5\frac{1}{4}$ in., and $11\frac{1}{4} \times 9\frac{1}{4} \times 4\frac{1}{4}$ in.)



Fig. 1504 1/2. WATER-ALCOVE.
(Old style.)

- NAMES OF PARTS: Figs. 1504-1504 1/2.
1. Water-alcove Front.
 2. Water-alcove Pan or Bottom.
 3. Alcove-faucet.
 4. Drip-pipe.



Fig. 1600. WATER-COOLER AND BASIN.
(Bridgman-style.)

1. Water-cooler.
2. Telegraph-cock.
3. Water-cooler Stand, or Wash-stand Sink.
4. Wash-bowl Drip-pipe.
5. Basin.

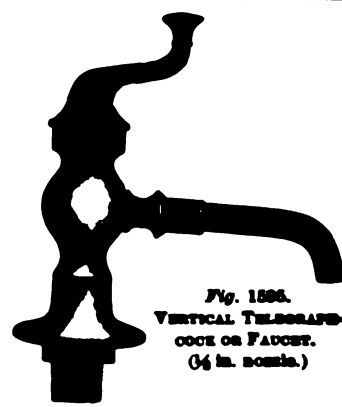


Fig. 1505.
VERTICAL TELEGRAPH-
COCK OR FAUCET.
($\frac{3}{4}$ in. nominal.)

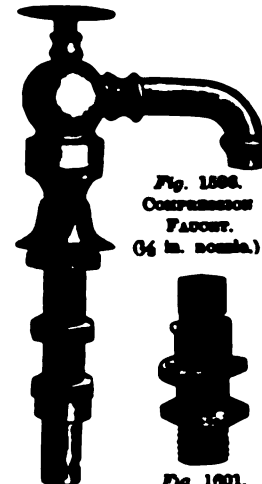


Fig. 1506.
COMPRESSION
FAUCET.
($\frac{3}{4}$ in. nominal.)



Fig. 1601.
WATER-COOLER
WASTE COCK.

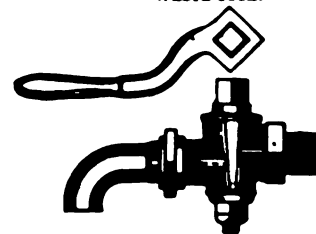


Fig. 1602. COMBINATION COCK.
(1-5 full size.)

FURNISHINGS, Window ; For Deck Sashes, etc.

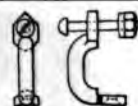
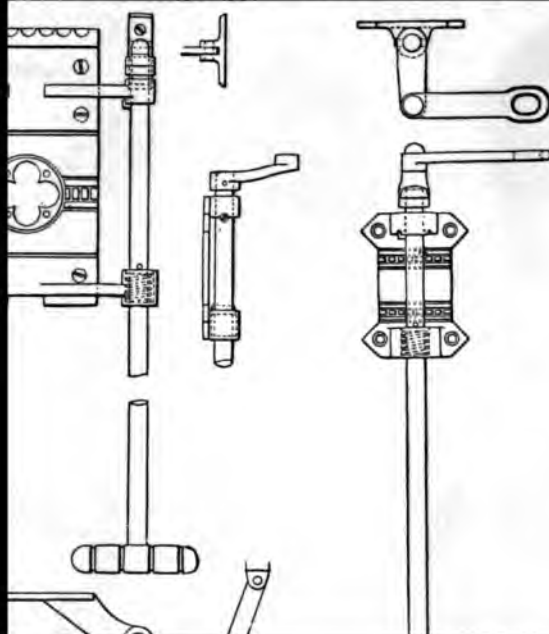


Fig. 1605.
SWIVEL FOR
END-VENTILATOR
OPENER.

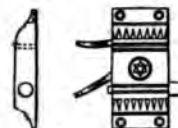


Fig. 1606.
SASH-LOCK.
(2 1/4 x 1 3/16 in.)

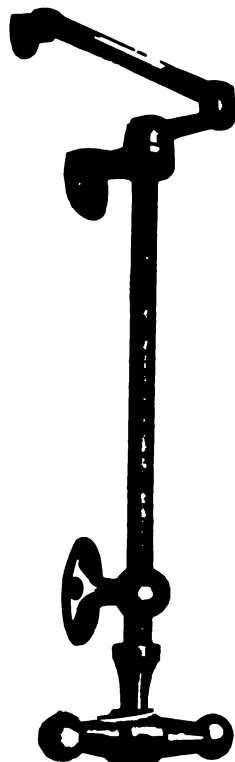


Fig. 1614.
DECK-SASH OPENER.



Fig. 1615.
DECK-SASH OPENER.



Fig. 1616.
DECK-SASH OPENER.

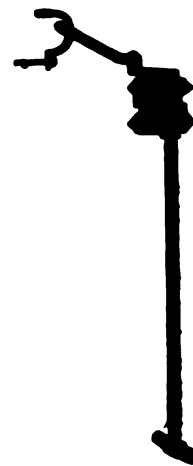


Fig. 1617.
END-VENTILATOR OPENER.

NAMES OF PARTS; Figs. 1622-1624.

- | | |
|--------------------|--------------------|
| A. Pivot-hole. | E. Pivot. |
| B. Detaching-slot. | F. Thumb-piece. |
| C. Ratchet. | G. Ratchet-spring. |
| D. Ratchet-bolt. | H. Pivot-spring. |



Fig. 1622.
PIVOT and RATCHET-PLATE.



Fig. 1623.
PIVOT and RATCHET-BOLT.

"MONITOR" DECK-SASH PIVOT AND RATCHET-CATCH.



Fig. 1624.
HART'S DECK-SASH PIVOT AND
RATCHET-CATCH.
(3/4 full size).



Fig. 1618. RATCHET-CLAMP.

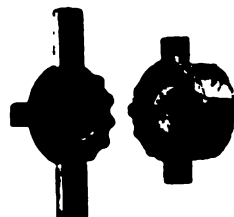


Fig. 1620. UPPER
RATCHET-PLATE and
RATCHET-SPRING.

MORGAN AUTOMATIC DECK-SASH PIVOT AND CLAMP.

Figs. 1625-1633. FURNISHINGS, Window ; For Deck Sashes.



Fig. 1625.
MANSFIELD DECK-SASH OPENER, window open.



Fig. 1631.
DECK-SASH SOCKET AND SPRING,
AND RATCHET-CATCH (half size).



Fig. 1627.
DECK-SASH CATCH ($\frac{3}{4}$ full size).
(For PULL-HOOK, used in connection
with fittings of this kind, see Fig.
1556.)

Fig. 1628.
KEEPER OR STRIKE-PLATE.



Fig. 1629.
DECK-SASH FLUSH-CATCH ($\frac{3}{4}$ full size).



Fig. 1632.
OUTSIDE VIEW OF DECK SASH,
showing Figs. 1631 and 1633 in use.



Fig. 1626.
MANSFIELD DECK-SASH
OPENER, windows
both closed.



Fig. 1630.
VENTILATOR-ARM ($\frac{3}{4}$ full size).



DECK-SASH
(h)



Fig. 1634.
DECK SASH-PULL, with screw.

(For PULL-HOOK used in connection with these fittings, see Fig. 1536.)

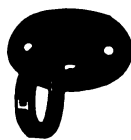


Fig. 1635.
DECK SASH-PULL,
with flange.



Fig. 1636.
DECK-SASH LATCH.

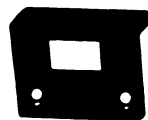


Fig. 1637.
DECK-SASH LATCH
KEEPER
OR STRIKE-PLATE.

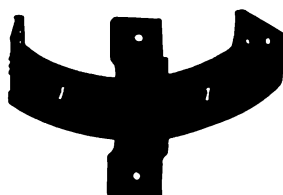


Fig. 1638.
DECK-SASH QUADRANT AND CLIP.
1. Quadrant.
2. Clip.



Fig. 1639.
DECK-SASH STOP.



Fig. 1645. Perspective View.

WILSON FLEXIBLE WINDOW-BLIND (See Figs. 1646-7.)
(The PAUL FLEXIBLE WINDOW-BLIND is another style accomplishing the same end in a different manner. See Dictionary ; not shown by illustration.)



Fig. 1640.
DECK-SASH DOUBLE-RATCHET
AND RATCHET-PLATE (Right hand).

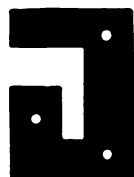


Fig. 1641.

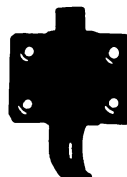


Fig. 1642.
DECK-SASH SPRING FITTER,
for movable sash.



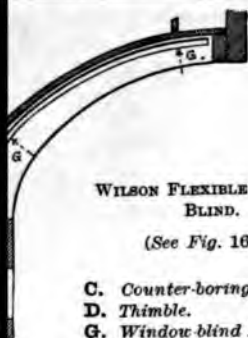
Fig. 1643.



Fig. 1644.

DECK-SASH DOUBLE-RATCHET
AND RATCHET-PLATE (Left hand).

FURNISHINGS, Window; For Lower Windows.



WILSON FLEXIBLE WINDOW-BLIND.

(See Fig. 1645.)

- C. Counter-boring.
- D. Thimble.
- G. Window-blind Pocket.
- H. Slat-wire Hole.
- S. Slat.
- W. Slat-wire.

(The Construction of framing for this style of window-blind is given in Figs. 185a and 185b.)



Fig. 1649.
SINGLE SASH-SPRING.



Fig. 1650.
SPIRAL SASH-SPRING.

Fig. 1648.
DOUBLE SASH-SPRING.



Fig. 1652.
V WINDOW-BUTTON.





Fig. 1663.

In act of raising sash.



Fig. 1664. Supporting sash.

AUTOMATIC WINDOW-CATCH (half-size.)



Fig. 1665.
SASH-LIFT.



Fig. 1667.
FLUSH SASH-LIFT.



Fig. 1666.
SASH-LIFT.



Fig. 1668.
SASH BAR-LIFT.



Fig. 1669.
END DOOR SASH-LIFT.



Fig. 1670.
END DOOR SASH-BOLT.



Fig. 1671.
KNOB SASH-LIFT.



Fig. 1672.
SASH BAR-LIFT (half-size).



Fig. 1673.
LOWER WINDOW-BLIND
LIFT.



Fig. 1674.
UPPER WINDOW-BLIND
LIFT.



Fig. 1675.
DOUBLE WINDOW-BLIND LIFT.



Fig. 1676.
WINDOW-BLIND LIFT.



Fig. 1677.
WINDOW-BLIND LIFT.



Fig. 1678.
WINDOW-BLIND LIFT.



Fig. 1679.
WINDOW-BLIND LIFT.



Fig. 1680.
WINDOW-BLIND BOLT (half-size).



Fig. 1681.
WINDOW-BLIND BUSHING
(full-size).



Fig. 1682.
WINDOW-BLIND LIFT.

(See also Figs. 1683-1687.)

URNISHINGS, Window; For Lower Windows.

Fig. 1684.



Fig. 1685.



McKAY'S CURTAIN-BRACKETS, No. 1.
(Half size.)

McKAY'S

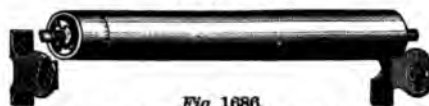
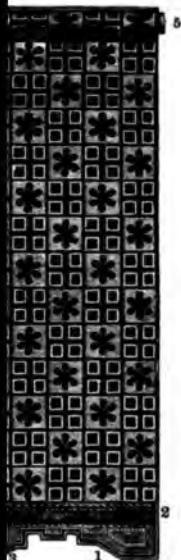


Fig. 1686.

HARTSHORN SHADE-ROLLER AND BRACKETS,
showing CENTRIFUGAL PAWLS.

(The McKay shade-roller is somewhat similar, but uses a
cam instead of a pawl.)



383.

OR CURTAIN.



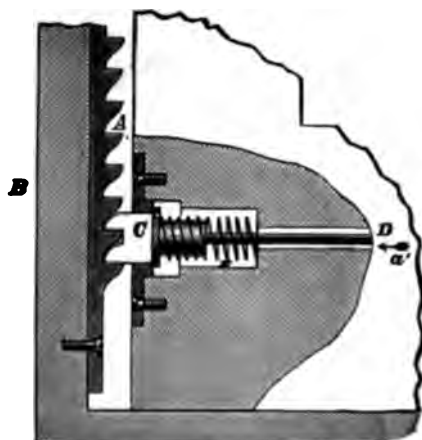


Fig. 1700. Section.
(D connects to the bell-crank F, Fig. 1702.)



Fig. 1701. LIFTING-PLATE.
Front View.



Fig. 1702. LIFTING-PLATE.
Side View.

WOLFRATH'S COMBINATION SASH-LIFT AND SASH-LOCK.

NAMES OF PARTS, Figs. 1700-1703.

- A. Rack.
- A'. Sash-lock.
- B. Window-casing.
- C. Ratchet-bolt.
- D. Ratchet-rod.
- E. Ratchet-mortise.
- F. Bell-crank.
- H. Face-plate.
- M. Lifting-plate.
- N. Finger-plate, or Trigger-plate.



Fig. 1704. Front
View of BEVELED
RACK. (Half size.)

- A. Spring.
- B. Band.
- C. Pinion.
- E. Carriage.
- F. Beveled Rack.
- Detent Latch not shown.

ORRERY SASH-BALANCE.



Fig. 1705. Applied to
window.

- A. Balance, complete.
- B. Window-casing.
- C. Beveled-rack on Window-stile.

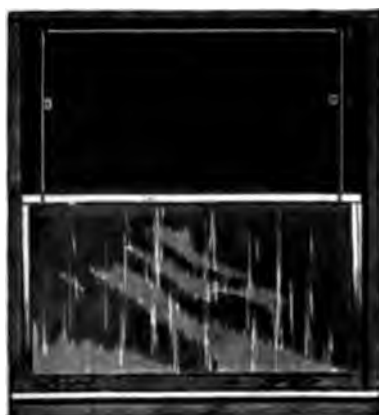


Fig. 1703. ORRERY SASH-BALANCE (overhead style).
(This drawing represents the principle of the
device only and not its actual application.)

NAMES OF PARTS, Fig. 1703.

- A. Cylinder.
- B. Pivot-rod.
- C. Lifting-spring.
- D. Window-cord.
- E. Window-rod.



Fig. 1707. ANDERSON SASH-BALANCE.

NAMES OF PARTS; Fig. 1707.

- 1. Lug.
- 2. Wire Cord.
- 3. Cone, or Fuses.
- 4. Frame.
- Pivot (not numbered).

ND CARS; General Views.



Fig. 1709.
LEVER HAND CAR.
(Shown in detail in Figs. 1720-1723.)



Fig. 1710
INSPECTION HA





Fig. 1716.
"CROSSMAN" HAND CAR.



Fig. 1717.
JEFFREY "RAILROAD SPREADER."

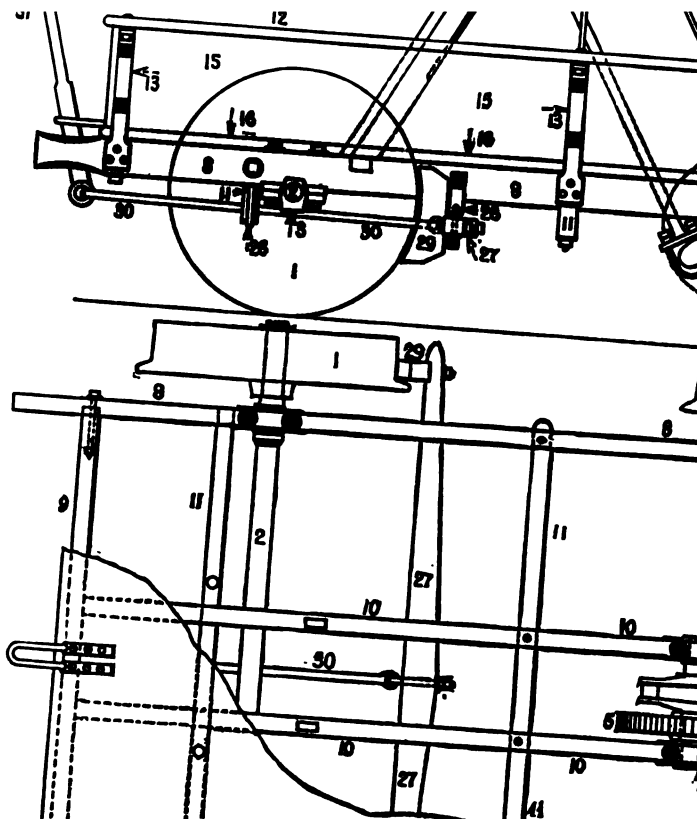
No.	Kind of Car.	Wheels.	Gearing.	Weight.
1.	Light Section.	34 in.	Slow or medium.	600 lbs.
2.	Heavy Section.	18 in.	Slow.	775 "
3.	Light Telegraph.	34 in.	Fast.	425 "
4.	Light Telegraph.	34 in.	Fast, with friction rollers.	450 "

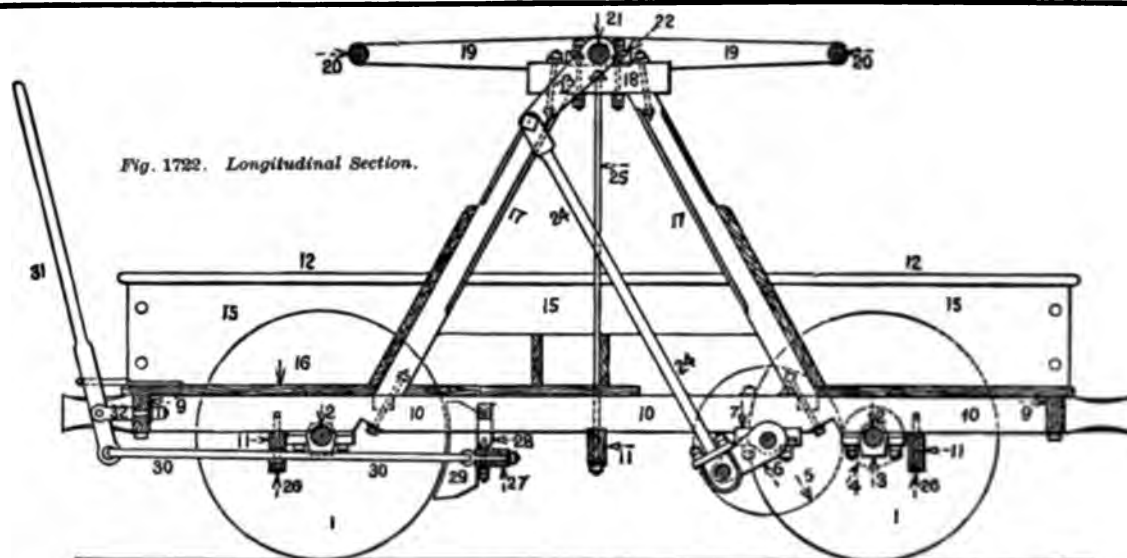


Fig. 1718.
"KALAMAZOO" HAND CAR (Narrow-gauge), with gas-pipe LEVER-FRAME.
(Brake applied inside the RAILS.)



Fig. 1719.
"SHEFFIELD" WOODEN-WHEEL HAND CAR.





Scale. 1 2 3 4 5 ft.

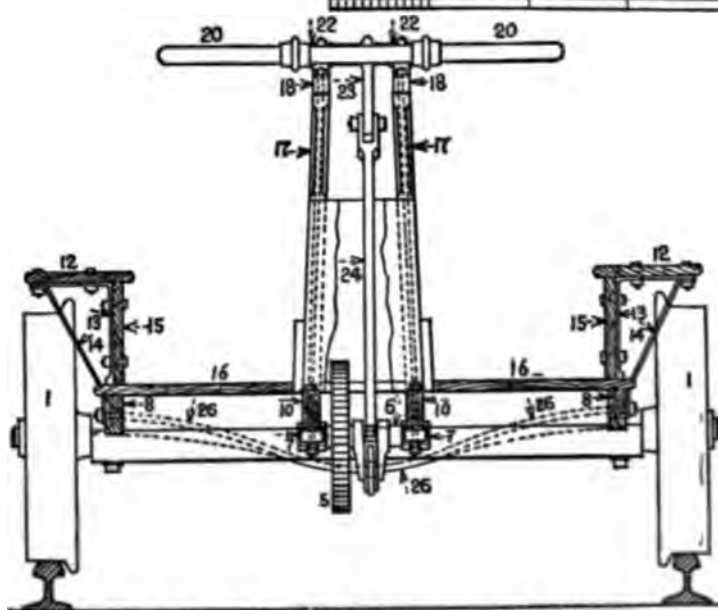


Fig. 1723. Transverse Section.

HAND CAR, PENNSYLVANIA RAILROAD.

NAMES OF PARTS OF HAND-CAR; *Fig.* 1720-22.

- | | |
|---|----------------------------------|
| 1. <i>Wheel.</i> | 16. <i>Floor.</i> |
| 2. <i>Axle.</i> | 17. <i>Lever-frame Post.</i> |
| 3. <i>Journal-box.</i> | 18. <i>Lever-frame Cap.</i> |
| 4. <i>Pinion.</i> | 19. <i>Hand-car Lever.</i> |
| 5. <i>Gear-wheel.</i> | 20. <i>Lever-handle.</i> |
| 6. <i>Crank-shaft.</i> | 21. <i>Lever-shaft.</i> |
| 7. <i>Crank-shaft Bearings.</i> | 22. <i>Lever-shaft Bearings.</i> |
| 8. <i>Side-sills.</i> | 23. <i>Bell-crank.</i> |
| 9. <i>End-sills.</i> | 24. <i>Connecting-rod.</i> |
| 10. <i>Centre-sills.</i> | 25. <i>Lever-frame Tie-rod.</i> |
| 11. <i>Cross-frames Tie-timber, or Needle-beam.</i> | 26. <i>Hand-car Tie-rod.</i> |
| 12. <i>Seat.</i> | 27. <i>Brake-beam.</i> |
| 13. <i>Seat-bracket.</i> | 28. <i>Brake-beam Hanger.</i> |
| 14. <i>Seat-bracket Braces.</i> | 29. <i>Brake-head.</i> |
| 15. <i>Rays, or Seat-ribs.</i> | 30. <i>Brake-rod.</i> |
| | 31. <i>Brake-lever.</i> |
| | 32. <i>Brake-lever Fulcrum.</i> |

HAND-CAR DETAILS.

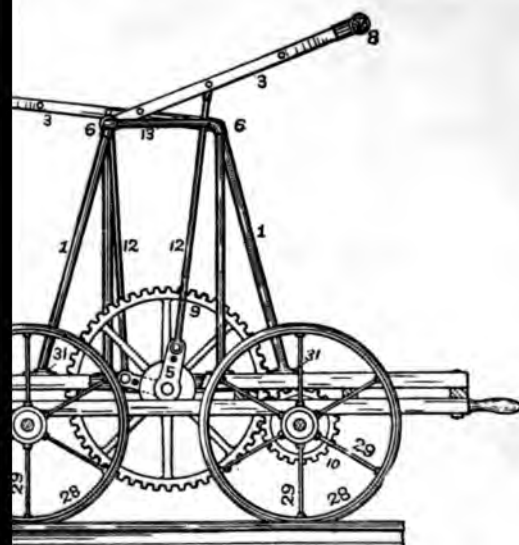


Fig. 1724. Side Elevation.

NAMES OF PARTS; Figs. 17

1. *Lever-posts.*
2. *S-brake on the Brake-axle.*
3. *Propelling-levers, or Hand-co*
4. *Brake-treadle.*
5. *Crank, with Adjusting-holes shaft.*
6. *Propelling-lever Fulcrum.*
7. *Side-rail over the Side-sill.*
8. *Propelling-lever Handles.*

Fig. 1727. EXTENSION-REACH, EIGHT-WHEEL LOGGING CAR.
(Narrow-gauge, Extra Heavy.)

[No. 4.]



Fig. 1728. EXTENSION-REACH, EIGHT-WHEEL LOGGING CAR.
(Standard Gauge.)
(No. 2, similar, but Narrow-gauge.)



[No. 5.]

Fig. 1729. FLEXIBLE TRUCK, EIGHT-WHEEL LOGGING CAR,
with Inside Journal-bearings.

[No. 8.]



(No. 11, similar to No. 10 but shorter.)

[No. 10.]



Fig. 1730. FLEXIBLE-FRAME LUMBER LARRY.

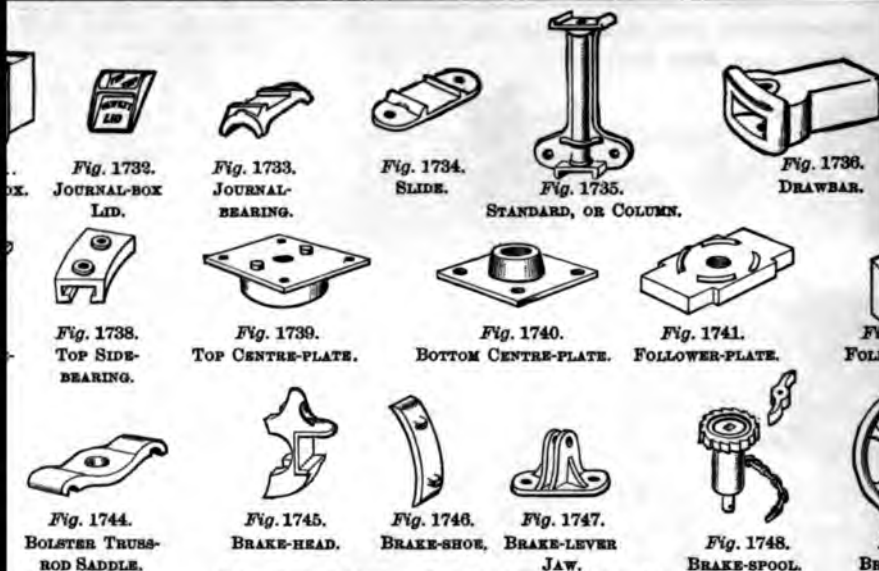
Capacity, 8,000 ft. B. M.
Weight, 6,900 lbs.
Height, 27 in.
Length, 21 ft. over all.
Wheels, 24 in., chilled, 325 lbs.
Bearing Springs, 20 tons capacity.
Axles, forged, 3½ in. centre, 4½ in. wheel seat.
Journal Brasses, 8 in. x 5½ in.
Bunks, 6 in. x 10 in. x 8 ft., trussed with two ½-in. round rods.
Truck-frames, 8 in. x ½ in., 8 in. x ½ in. and 8 in. x ½ in.
Wheel-base, of truck, 8 ft. 6 in.; of car, 14 ft. 6 in.

Capacity, 2,500 ft. B. M.
Weight, 5,600 lbs.
Height, 27 in.
Length, 21 ft. over all.
Wheels, 24 in. chilled, 265 lbs.
Bearing Springs, 20 tons capacity.
Axles, forged, 3½ in. centre, 3½ in. wheel seat.
Journal Brasses, 8 in. x 5½ in.
Journal Boxes, Hewitt Patent Cover.
Bunks, 8 in. x 10 in. x 9 ft. placed to come 10 ft. 6 in. apart.
Truck-frames, 2½ in. x ½ in., 2½ in. x ½ in. and 2½ in. x ½ in.
Wheel-base, of truck, 8 ft. 2 in.; of car, 18 ft. 8 in.
Draft Link, 18 in. above track.

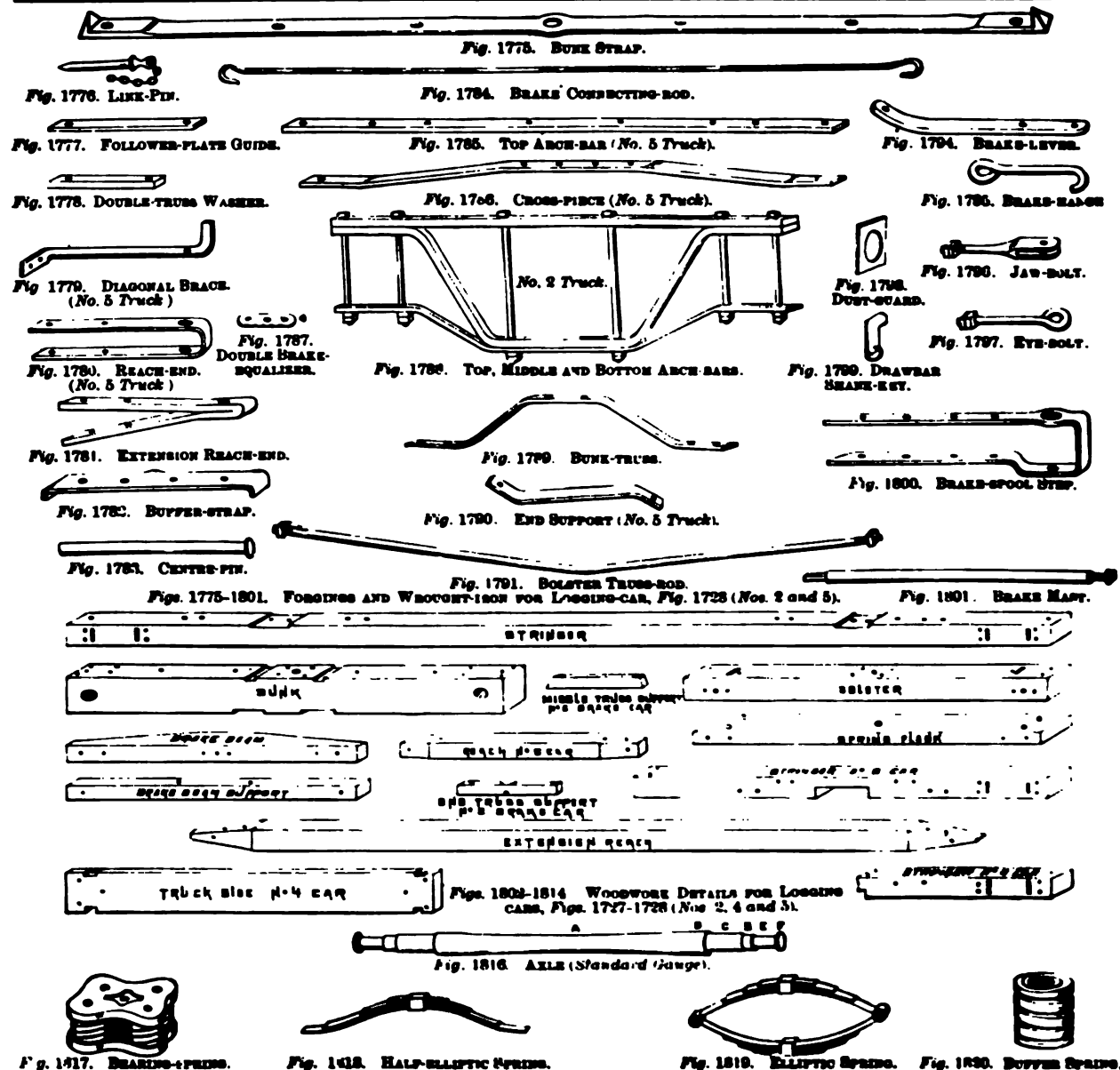
Capacity, 1,500 ft. B. M.
Weight, 4,000 lbs.
Height, 24 in.
Length, 21 ft. over all.
Wheels, 20 in. chilled, 300 lbs.
Axles, 2½ in., rolled.
Journal Boxes, babbitted (oil chamber below).
Bunks, 8 in. x 10 in. x 7 ft., placed 10 ft. 6 in. apart (centres).
Wheel-base, of truck, 8 ft.; of car, 18 ft. 6 in.

Capacity, 2,000 ft. B. M.
Weight, 1,500 lbs.
Height, 25 in.
Length, 18 ft. over all.
Wheels, 22 in. chilled, 150 lbs.
Axles, 2½ in., rolled.
Journal Boxes, inside bearing, with oil chamber.
Journal Brasses, rocking, 2½ in. x 4½ in.
Bunks, 4½ in. x 5 in. x 5 ft., placed 8 ft. 10 in. apart (centres).
Wheel-base, 5 ft., one wheel loose on each axle.

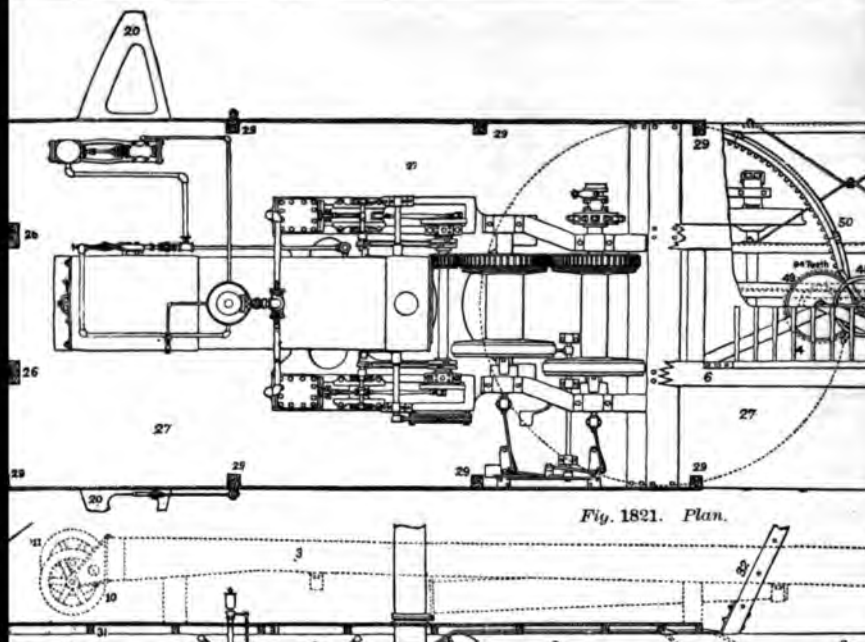
LOGGING-CAR DETAILS, Castings.



CASTINGS FOR LOGGING CAR, Fig. 1728 (Nos. 2 and 5).



PILE-DRIVER CAR.



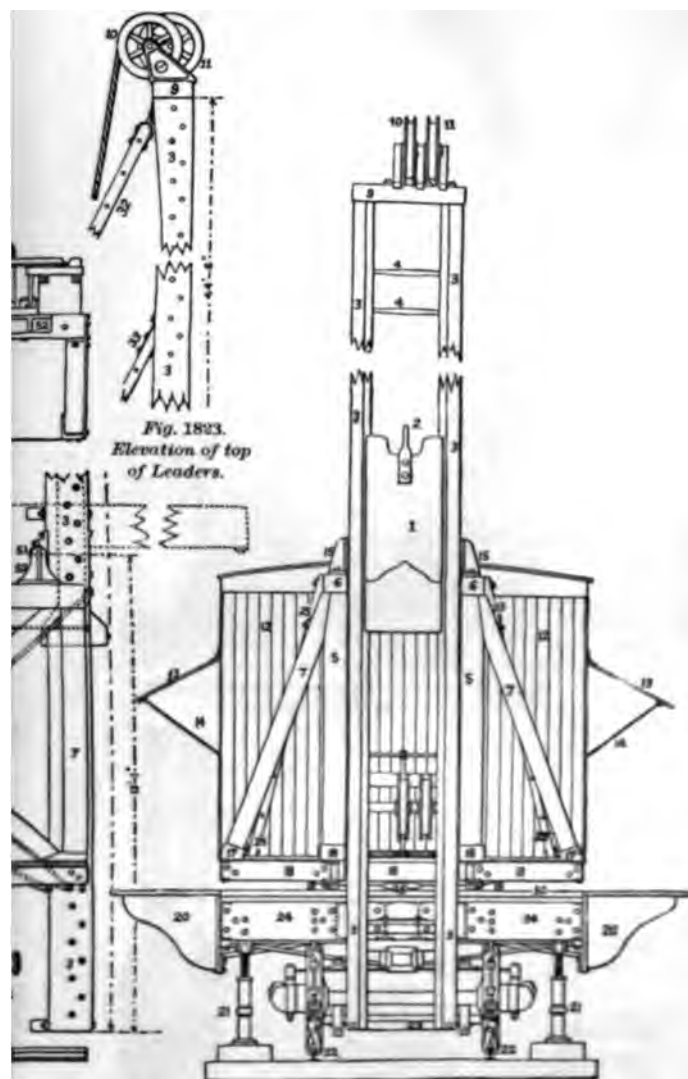


Fig. 1821. End Elevation.

NAMES OF PARTS; Figs. 1821-1824.

- | | |
|--|---|
| 1. Hammer, lifted by Shears. | 27'. Body-brace. |
| 2. Hammer-eye, or Clevis. | 28. Body Counter-brace. |
| 3. Leaders. | 29. Cabin Studding. |
| 4. Stringer Sway braces (and Main Ladder 32.) | 30. Cabin Scantling. |
| 5. Pilasters. | 31. Carline. |
| 6. Top stringers. | 32. Main Ladder, swinging on Ladder-trunnions. |
| 7. Leader-brace. | 33. Lower Ladder. |
| 8. Cabin Ladder. | 34. Crane. |
| 9. Leader Cap. | 35. Guy-rope. |
| 10. Main Sheave. | 36. Hog-chain. |
| 11. Pile-hoisting Sheave. | 37. Truss Rod. |
| 12. Sheathing, of Cabin. | 38. Counterbrace Rod. |
| 13. Cabin-shutter. | 39. Hammer-rope. |
| 14. Cabin Shutter-brace. | 40. Hammer-rope Pulley. |
| 15. Leader-trunnion Pedestal. | 41. { Spools controlled by Strap-brake and Treadle. } Winding Gear. |
| 16. Pilaster-pockets. | 42. { } |
| 17. Leader-brace Pocket. | 43. Driving Chain. } Pitch Chains. |
| 18. Swinging Platform End-sill. | 44. Connecting Chain. } |
| 18'. Swinging-platform Sill. | 45. Pitch gear. |
| 19. Main Rollers. | 46. Swinging-platform Centre-plate (upper and lower). |
| 20. Wings (front and back). | 47. Track. |
| 21. Jack-screw, working on a Jack-screw Pin attached to body. | 48. { Hand-wheel. } Slewing Gear. |
| 22. Tongs, or Crabs. | 49. { Spur-wheel. } |
| 23. Leader Cross piece. | 50. Slewing-rack. |
| 24. End-sill. | 51. Leader Trunnion. |
| 25. (Fig. 1821.) Outside Sills (Channel Bars). (Fig. 1824.) Leader-stay. | 52. Leader-trunnion Pedestal. |
| 26. Main Posts. | |
| 27. Swinging-platform, or Upper Platform. | |

Leaders, to take in 40 ft. pile.
Hammer, 4,500 lbs.

Thickens tracks (front track removable). Motive power sufficient to propel car and two loaded cars attached. Fuel and water carried on a small locomotive tender.

SCREW THREADS.



Fig. 1826.
M. C. B. STANDARD
LIMIT GAUGE.
for $1\frac{1}{4}$ in. round iron

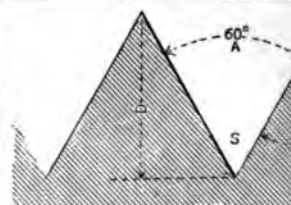
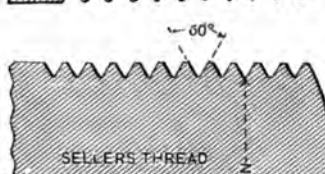
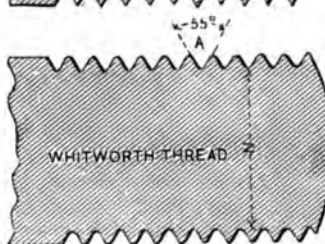
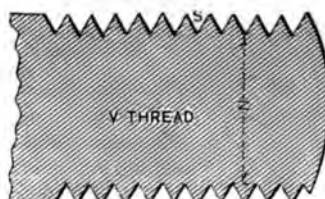


Fig. 1827. V SCREW-TH

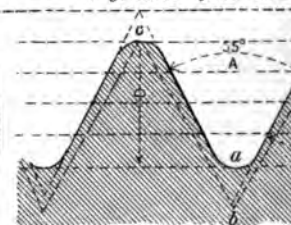



















Fig. 1828. WHITWORTH STANDARD
English and Continental



MASTER CAR-BUILDERS' STANDARD DIMENSIONS FOR BOLTS AND NUTS (BELLING STANDARD THREADS).

Diam. of Screw.	Threads per inch.	Diameter at root of Thread.	Area of Bolt at root of Thread.	Width of Flat.	Short Diam. Rough.	Short Diam. Finish.	Long Diam. Rough.	Long Diam. Finish.	Thickness Rough.	Thickness Finish.	Short Diam. Rough.	Short Diam. Finish.	Long Diam. Rough.	Long Diam. Finish.	Thickness Rough.	Thickness Finish.
																
1/8	20	.185	.026	.0092	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
1/4	18	.240	.045	.0074	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
3/8	16	.294	.067	.0078	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
1/2	14	.344	.092	.0089	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5/8	12	.400	.125	.0096	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8
3/4	12	.454	.161	.0104	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
7/8	11	.507	.201	.0113	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
1	10	.560	.241	.0125	1	1	1	1	1	1	1	1	1	1	1	1
1 1/8	9	.620	.301	.0138	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
1 1/4	8	.687	.350	.0156	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1 3/8	7	.740	.393	.0178	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
1 1/2	7	.805	.440	.0178	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
1 3/4	6	.860	.486	.0208	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4
2	6	.914	.534	.0208	2	2	2	2	2	2	2	2	2	2	2	2
2 1/8	5	.969	.581	.0227	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
2 1/4	5	1.024	.629	.0250	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4
2 3/8	5	1.079	.677	.0250	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8
2 1/2	5	1.134	.725	.0250	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
2 3/4	4	1.189	.773	.0277	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4
3	4	1.244	.821	.0277	3	3	3	3	3	3	3	3	3	3	3	3
3 1/8	4	1.299	.869	.0303	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8
3 1/4	4	1.354	.917	.0303	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
3 3/8	4	1.409	.965	.0312	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8
3 1/2	4	1.464	.1013	.0312	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
3 3/4	3	1.519	.1061	.0357	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4
4	3	1.574	.1109	.0357	4	4	4	4	4	4	4	4	4	4	4	4
4 1/8	3	1.629	.1157	.0384	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8	4 1/8
4 1/4	3	1.684	.1205	.0384	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4
4 3/8	3	1.739	.1253	.0413	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8
4 1/2	3	1.794	.1301	.0413	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2
4 3/4	2	1.849	.1349	.0454	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4
5	2	1.904	.1397	.0454	5	5	5	5	5	5	5	5	5	5	5	5
5 1/8	2	1.959	.1445	.0476	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8
5 1/4	2	2.014	.1493	.0476	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4
5 3/8	2	2.069	.1541	.0500	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8
5 1/2	2	2.124	.1589	.0500	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
5 3/4	2	2.179	.1637	.0528	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4
6	2	2.234	.1685	.0528	6	6	6	6	6	6	6	6	6	6	6	6

(Square nuts are of the same width, between parallel faces, as hexagon. The following are the general rules for the dimensions of nuts and bolt-heads on which the above table is based :

Diameter Rough Nut = one and one-half diameter of bolt + 1/8.
 " Finished Nut = one and one-half diameter of bolt + 1-16.
 " Rough Head = one and one-half diameter of bolt + 1/8.
 " Finished Head = one and one-half diameter of bolt + 1-16.

Thickness Rough Nut = diameter of bolt.
 " Finished Nut = diameter of bolt - 1-16. [head.
 " Rough Head = one-half distance between parallel sides of
 " Finished Head = diameter of bolt - 1-16.

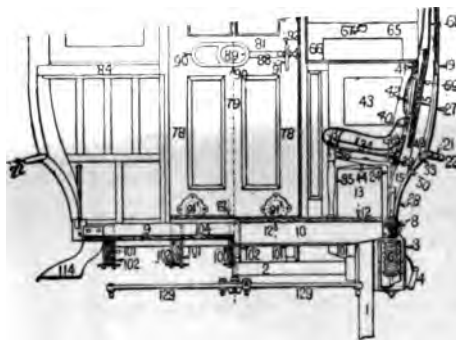


Fig. 1844.

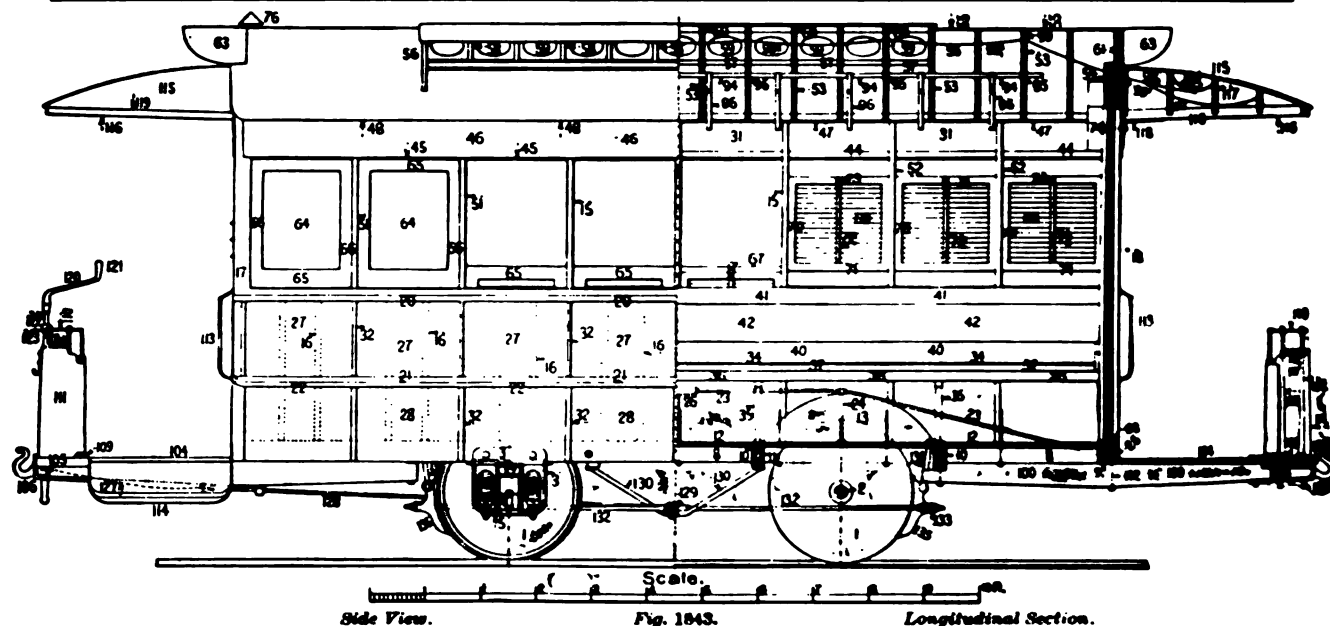
End View, Showing Framing.

Section.

STREET CAR.

NAMES OF PARTS OF STREET CARS ; Fig

- | | | |
|-------------------------------------|--------------------------------------|---------------------|
| 1. Wheel. | 20. Belt-rail Band. | 36. Front Se |
| 2. Axle. | 21. Fender-rail. | 37. Front Se |
| 3. Pedestal. | 22. Fender-guard. | 38. Back Se |
| 4. Journal-box. | 23. Inverted Body Truss-rod, | 39. Back Se |
| 5. Jaw-bit. | or Hog-chain. | 40. Lower S |
| 6. Side Journal-spring. | 24. Inverted Body Queen- | 41. Upper S |
| 7. Spring-saddle. | post. | 42. Seat-bac |
| 8. Sill. | 25. Inverted Truss-rod Plate. | 43. End Sea |
| 9. End-sill. | 26. Turnbuckle. | 44. Upper E |
| 10. Transverse Floor-timber. | 27. Outside-panel. | 45. Window |
| 11. Sill Tie-rod. | 28. Lower Outside-panel. | 46. Letter-b |
| 12. Floor. | 29. Upper End-panel. | 47. Plate. |
| 13. Wheel-box. | 30. Lower End-panel. | 48. Frame-m |
| 14. Wheel-box Button. | 31. Inside Panel. | |



Side View.

Fig. 1843.
STREET CAR.

Longitudinal Section.

- | | | | |
|----------------------------------|-------------------------------------|--------------------------------------|----------------------------------|
| 73. Window-blind Lift. | 91. Sliding-door Handle. | 105. Platform-timber Band. | 121. Brake-shaft Crank-handle. |
| 74. Lamp-case. | 91'. Door-sheave. | 106. Draw-hook. | 122. Brake-shaft. |
| 75. Lamp-case Door. | 92. Door-latch Plate. | 107. Helper-ring. | 123. Upper Brake-shaft Bearing. |
| 76. Lamp-case Chimney. | 92'. Sliding-door Holder. | 108. Platform-post. | 124. Lower Brake-shaft Bearing. |
| 77. Window-guards. | 93. Door-sill. | 109. Base-washer, for Platform-post. | 125. Brakes Ratchet-wheel. |
| 78. Door-sill. | 94. Inside Hand-rail. | 110. Platform-rail. | 126. Brake-pawl. |
| 79. Door-mullion. | 95. Inside Hand-rail Bracket. | 111. Dash-guard. | 127. Brake-shaft Chain. |
| 80. Door-window Mullion. | 96. Hand-straps. | 112. Dash-guard Straps. | 128. Brake-shaft Connecting-rod. |
| 81. Middle, or Lock Door-rail. | 97. Signal-bell. | 113. Body Hand-rail. | 129. Centre Brake-lever. |
| 82. Top Door-rail. | 98. Bell-strap. | 114. Platform-step, or Side-step. | 130. Centre Brake-lever Spider. |
| 83. Door-case Top-rail. | 99. Bell-strap Guide. | 115. Platform-hood. | 132. Secondary Brake-rod. |
| 84. Door-case Intermediate-rail. | 99'. Bell-strap Guide, with Roller. | 116. Platform-hood Bow. | 133. Brake-beam. |
| 85. Door-case Top-panel. | 100. Draw-timber. | 117. Platform-hood Car-line. | 134. Brake-hanger. |
| 86. Door-case Sash. | 102. Platform-timber Clamps. | 118. Platform-hood Knee. | 135. Brake-head. |
| 87. Door-case Sash-button. | 103. Platform End-timber. | 119. Platform-hood Moulding. | 136. Rubber-tread. |
| 88. Door Guard-band. | 104. Platform, or Platform-floor. | 120. Brake-shaft Crank. | |

Fig. 1835. INCLINED-PLANE CAR.



Fig. 1837. TWO-MORSE STREET CAR, with two platforms.

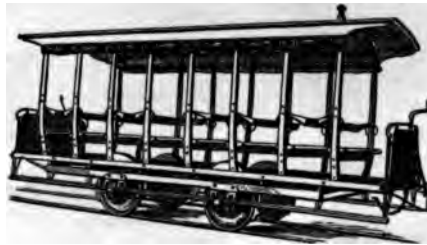
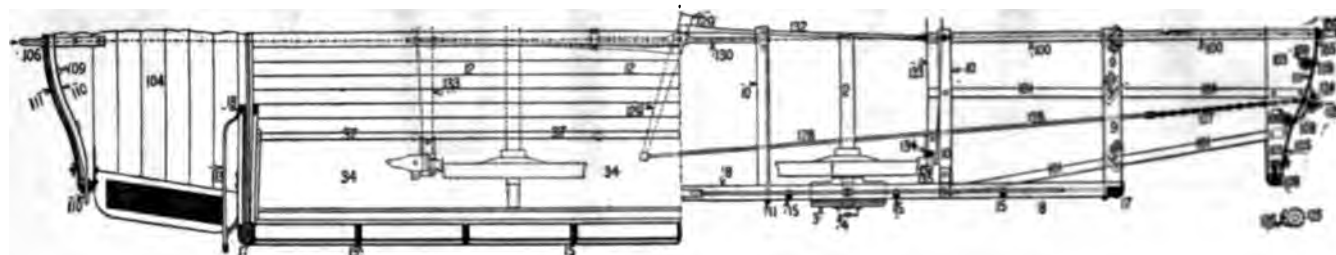


Fig. 1839. SUMMER STREET CAR, with reversible seats.



Fig. 188

Numbers refer to List of Names of Parts on preceding page.



Showing Floor, Seats, etc.

Fig. 1846.
HALF-PLAN OF STREET CAR.

Showing Framing.

STREET-CAR FURNISHINGS.

(An incomplete presentation of a few only of the more common furnishings.)

Fig. 1847.
BELL-STRAP GUIDE.

Fig. 1848.
BELL-STRAP GUIDE.

Fig. 1849.
BELL-STRAP GUIDE, with
Screw-top.

Fig. 1850.
BELL-STRAP
GUIDE,
with Roller.

Fig. 1851.
SLIDING-DOOR
HANDLER.

Fig. 1852.
SLIDING-DOOR HOLDER.

Fig. 1853.
SLIDING-DOOR-
HOLDER CATCH.

Fig. 1854.
SLIDING-DOOR SHEAVE.

Fig. 1855.
SLIDING-DOOR FRICTION-
ROLLER.

Fig. 1856.
INSIDE HAND-RAIL
BRACKET.

Figs. 1857-1858.
SLIDING-DOOR LATCH
AND KEEPER.

Fig. 1859.
SIGNAL-BELL.

Fig. 1860.
LAMP-CASE HOOK.
(Engages with a small Eye.)

Fig. 1861.
ECCENTRIC WINDOW-BUTTON.

Fig. 1862.
LAMP-CASE DOOR-HOLDER.

Fig. 1863.
DECK-CASE
PIVOT.

Fig. 1864.
DECK-CASE PIVOT-
PLATE.

SUNDRIES.



Fig. 1866.
MACHINE-BOLT,
Hexagon-head.



Fig. 1867.
CARRIAGE-BOLT.



Fig. 1868.
LAG-SCREW.



Fig. 1869.
LUG-BOLT.



Fig. 1870.
U-BOLT OR STRAP-BOLT.



Fig. 1871.
KEY-BOLT.



ASHER. *Fig. 1874.*
BEVELED-WASHER.



Fig. 1875.
DOUBLE-WASHER.



Fig. 1876.
JOINT-BOLT.



Fig. 1878.
SOCKET-WASHER.



Fig. 1879.
CAR-WASHER.



Fig. 1880.
TORPEDO.



Fig.
SINGLE-SCREW.



Fig.
RIGHT-AND-LEFT.



Fig. 1898. WAGON-TRUCK.



Fig. 1899. WAGON-TRUCK.



Fig. 1900. BAGGAGE-BARROW.



Fig. 1901. BAGGAGE-BARROW.



Fig. 1902. BAGGAGE WAGON-TRUCK.

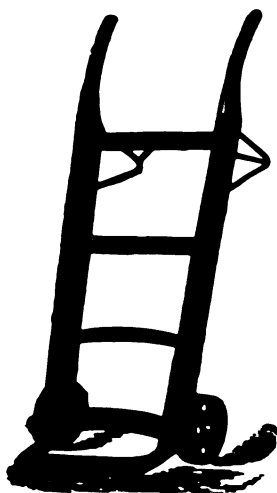


Fig. 1903. FREIGHT-TRUCK.



Fig. 1904. SWING-BARREL TRUCK.

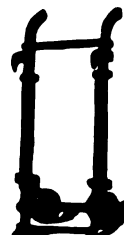


Fig. 1905. TELESCOPE TRUCK.

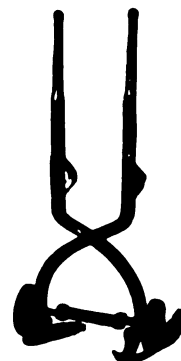


Fig. 1906.
JOHNSON'S SELF-
LOADING TRUCK.
Weight, 75 lbs.
Capacity, 1000 lbs.

(Baggage Barrows and Freight Trucks are both sometimes designated as BARROW-TRUCKS.)

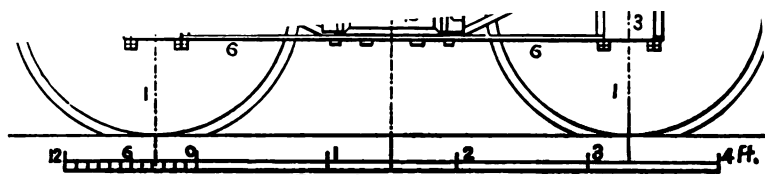


Fig. 1907. Side View.

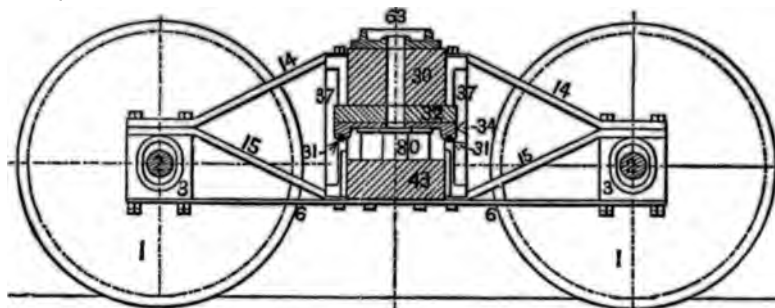


Fig. 1908. Longitudinal Section.

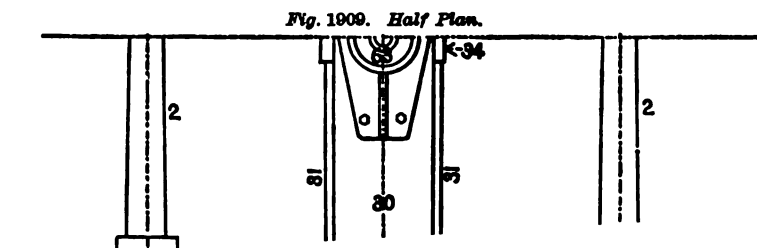
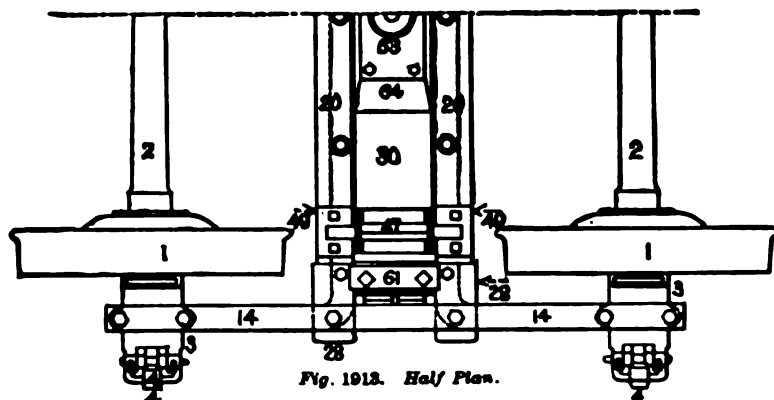
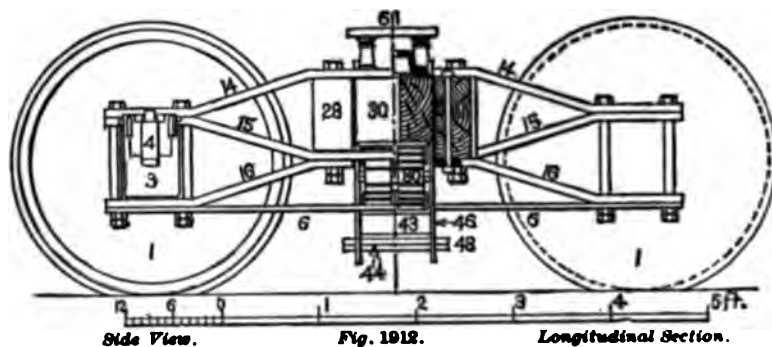
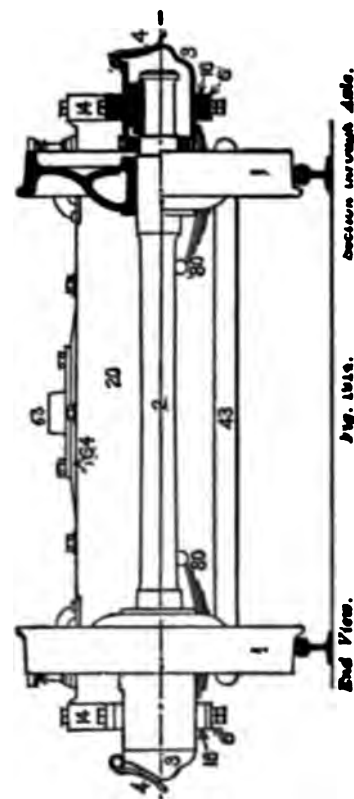


Fig. 1909. Half Plan.

NEW YORK CENTRAL & HUDSON RIVER RAILROAD FREIGHT-CAR TRUCK. (Old standard. Present standard shown in Figs. 1916-1920.)

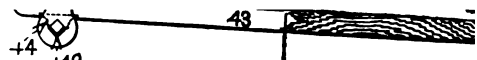


DIAMOND TRUCK, NEW YORK CENTRAL AND HUDSON RIVER RAILROAD (Old Standard).

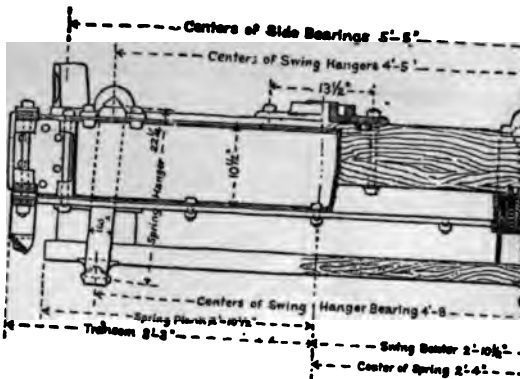


NAMES OF THE PARTS OF CAR-TRUCKS; Figs. 1907-1920.

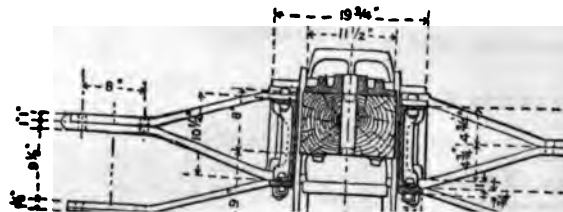
- | | | | |
|-------------------------|--------------------------------------|------------------------------------|--|
| 1. Wheel. | 29. Transom. | 37. Bolster Guide-bars, or Column. | 49. Swing-hanger ² Pivot-bearing. |
| 2. Axle. | 27. Transom Chafing-plate. | 38. Bolster Guide-block. | 61. Truck Side-bearing. |
| 3. Journal-box. | 36. Transom-casting. | 43. Spring-plank. | 63. Truck Centre-plate. |
| 4. Journal-box Cover. | 30. Truck-bolster. | 44. Spring-plank Bearing. | 64. Centre-plate Block. |
| 5. Pedestal. | 31. Truck-bolster Truss-rod. | 45. Swing-hangers. | 74. Bolster Spring-seat. |
| 6. Pedestal Tie-bar. | 34. Truck-bolster Truss-rod Bearing. | 47. Upper Swing-hanger Pivot. | 75. Bolster Spring-cap. |
| 14. Arch-bar. | 35. Truck-bolster Truss-rod Washer. | 48. Lower Swing-hanger Pivot | 80. Bolster-spring. |
| 15. Inverted Arch-bar. | | | |
| 16. Auxiliary Arch-bar. | | | |



Transverse Section. *Fig. 1915.* Section
 DIAMOND TRUCK, N. Y. CENTRAL & HUDSON RIVER RAILROAD.



Transverse Section. *Fig. 1916.* Section





7806

TRUCKS, Freight-car; Diamond Type.

Figs. 1918-1920

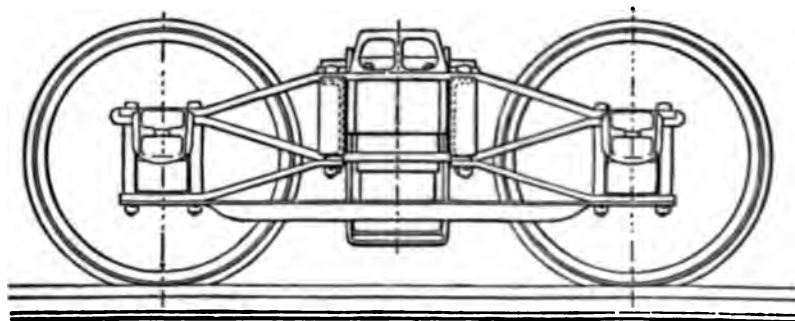


Fig. 1918.

Side Elevation.

**NEW YORK CENTRAL & HUDSON RIVER RAILROAD
AND CONNECTING LINES.**

STANDARD FREIGHT-CAR TRUCK.

*(Names of Parts are the same as in old
standard, Figs. 1912-1915.)*

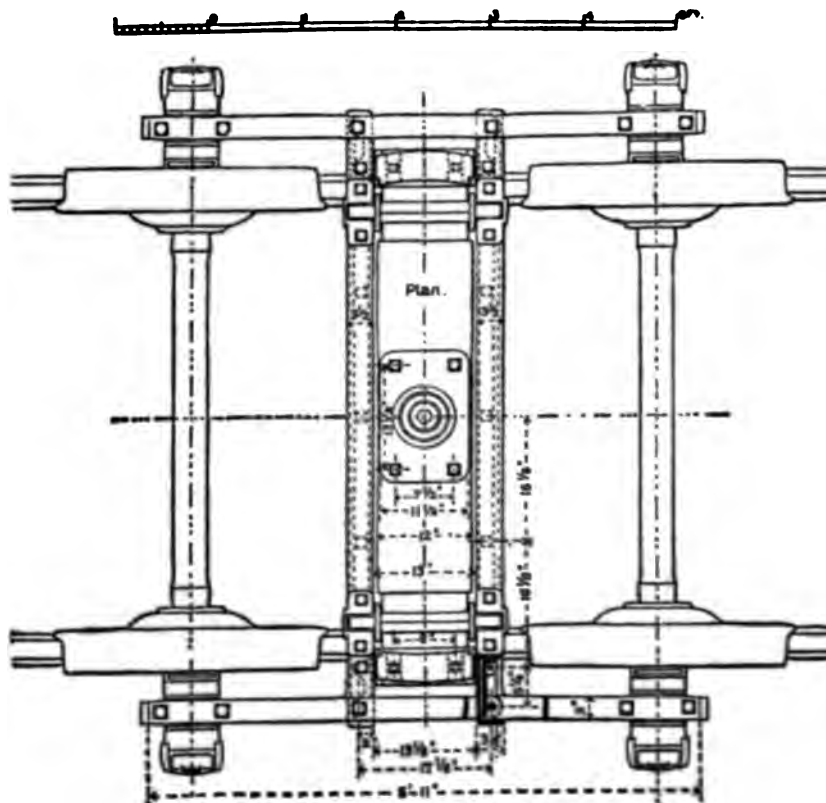


Fig. 1919. Plan.

DIAMOND TRUCK, NEW YORK CENTRAL & HUDSON RIVER RAILROAD (New Standard)

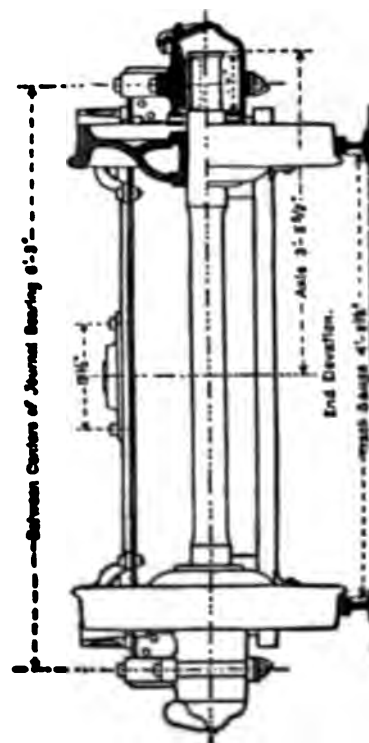
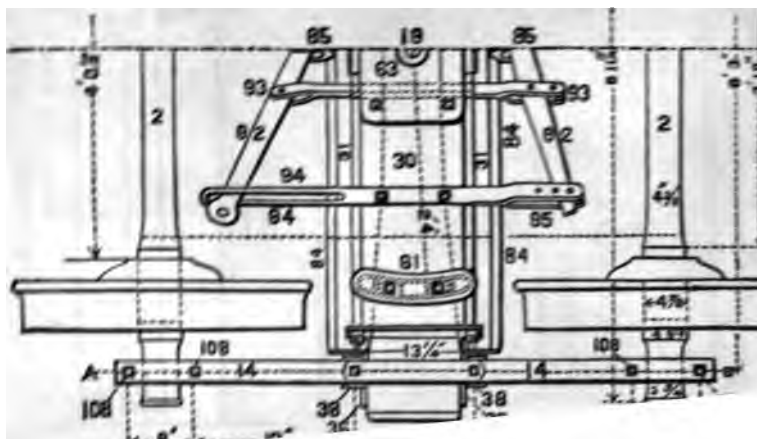
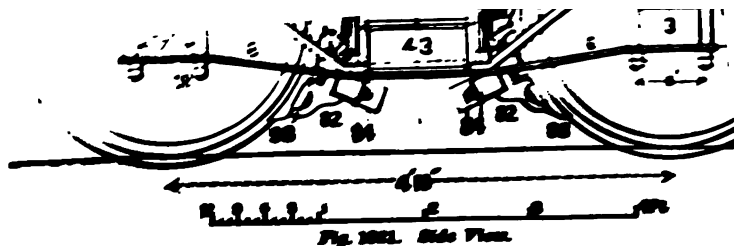


Fig. 1920.

End Elevation.



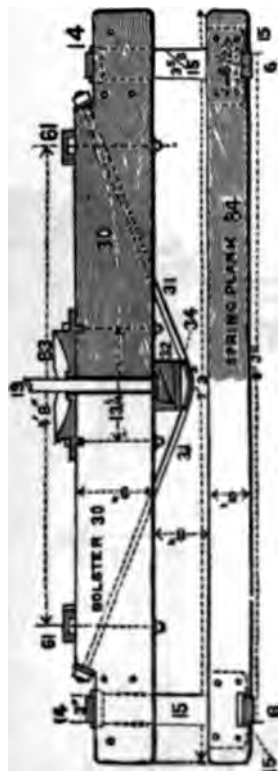


Fig. 1996.
Transverse Section.

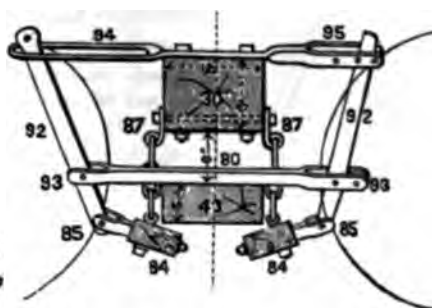


Fig. 1994. Section through Bolster.

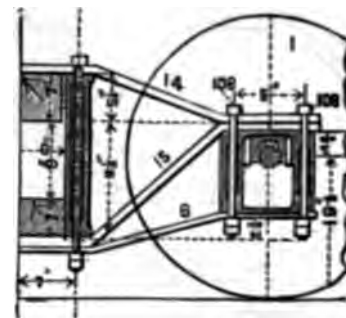
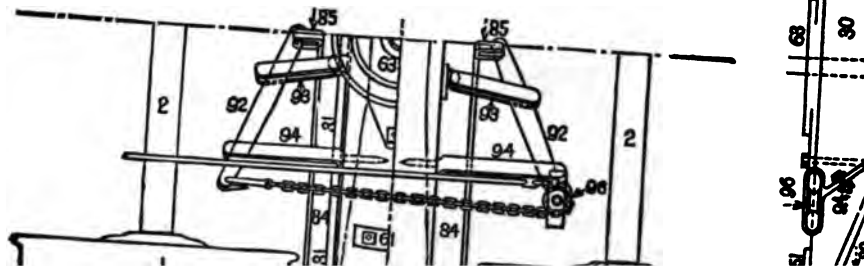
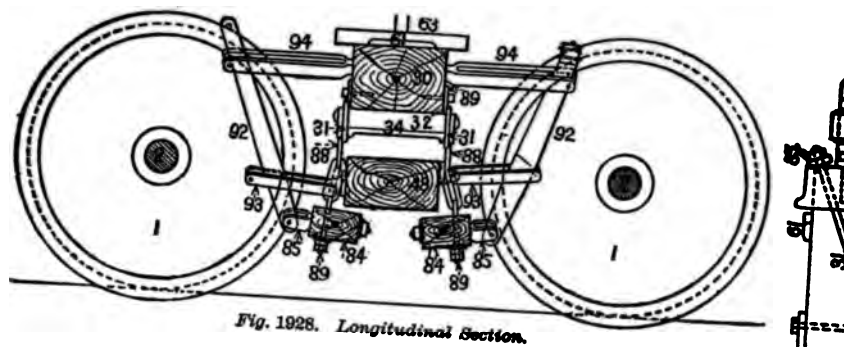
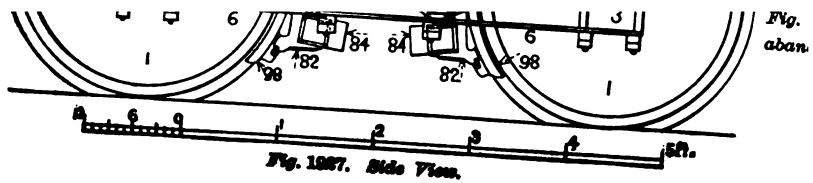


Fig. 1995. Section through Truck-frame.

NEW YORK, WEST SHORE & BUFFALO RAILWAY STANDARD FREIGHT-CAR TRUCK.

NAMES OF PARTS OF CAR TRUCKS; Figs. 1991-1996.

- | | |
|--------------------------------------|----------------------------------|
| 1. Wheel. | 63. Truck Centre-plate. |
| 2. Axle. | 80. Bolster-spring. |
| 3. Journal-box. | 82. Brake-block. |
| 4. Journal-box Cover. | 34. Brake-beam. |
| 6. Pedestal Tie-bar. | 65. Brake Eye-bolt. |
| 14. Arch-bar. | 66. Brake-hanger. |
| 15. Inverted Arch-bar. | 87. Brake-hanger Carrier. |
| 19. King-bolt, or Centre-pin. | 38. Brake Safety-chain. |
| 20. Truck-bolster. | 89. Brake Safety-chain Eye-bolt. |
| 31. Truck-bolster Truss-rod. | 92. Brake-lever. |
| 32. Truck-bolster Truss-block. | 93. Brake-lever Fulcrum. |
| 33. Truck-bolster King-post. | 94. Brake-lever Guide. |
| 34. Truck-bolster Truss-rod Bearing. | 95. Brake-lever Stop. |
| 35. Truck-bolster Truss-rod Washer. | 96. Brake-lever Sheave. |
| 36. Truck-bolster Chafing-plate. | 97. Lower Brake-rod. |
| 37. Bolster Guide-bar. | 98. Brake-shoe. |
| 38. Bolster Guide-block. | 107. Body Centre-plate. |
| 43. Spring-plank. | 108. Journal-box Bolt. |
| 61. Truck Side-bearing. | 109. Column Bolt. |



Numbers refer to List of Names of Parts on second page ahead or back.

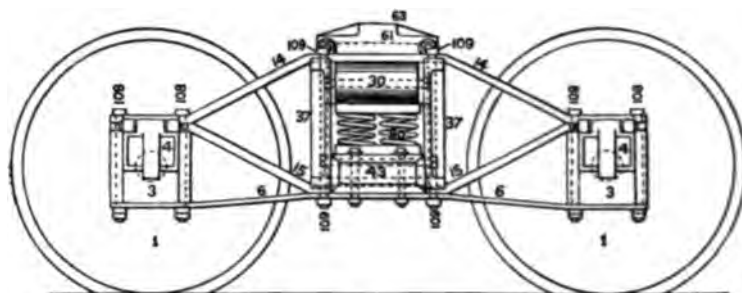


Fig. 1983. Side View.

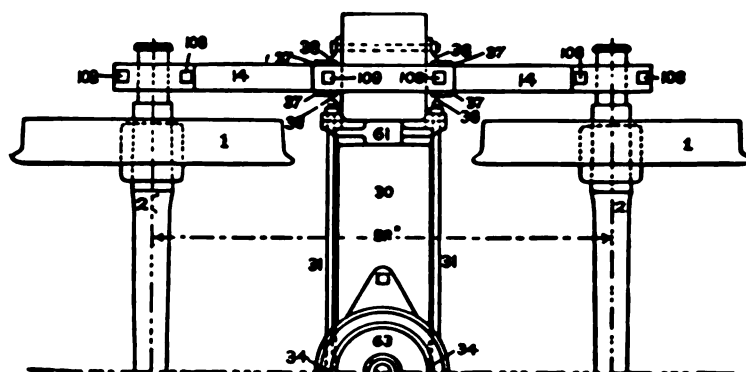


Fig. 1984. Plan.

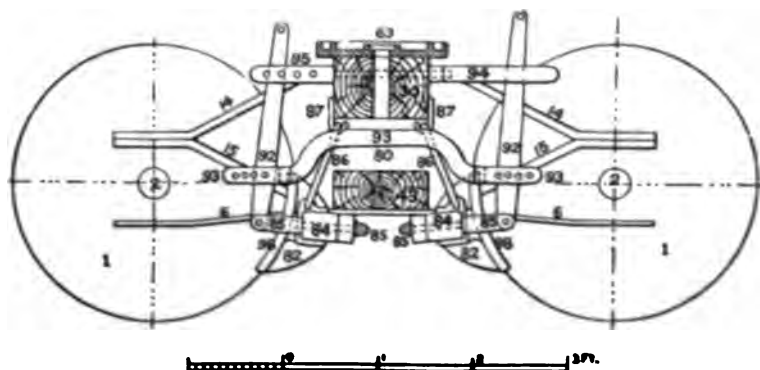


Fig. 1985. Longitudinal Section.

DIAMOND TRUCK, PHILADELPHIA & READING RAILROAD.

PHILADELPHIA & READING RAIL-
ROAD STANDARD FREIGHT-
CAR TRUCK.

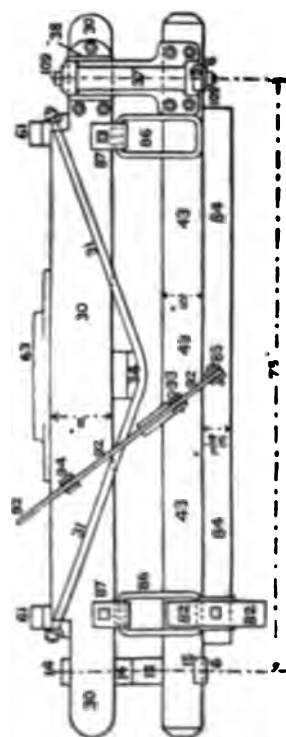


Fig. 1986. End View.

Fig. 1938. Side View.

Technical drawing of a mechanical assembly. The drawing shows a central vertical component with a complex internal structure, including a circular feature with a central hole and a smaller circular feature below it. The central component is flanked by two vertical rods, each labeled with the number '2'. Dimensions are indicated by arrows and numbers: '47' and '49' on the left side, and '49' and '47' on the right side. The central component has a width of '20' at the top and '20' at the bottom. The drawing is a cross-section view.

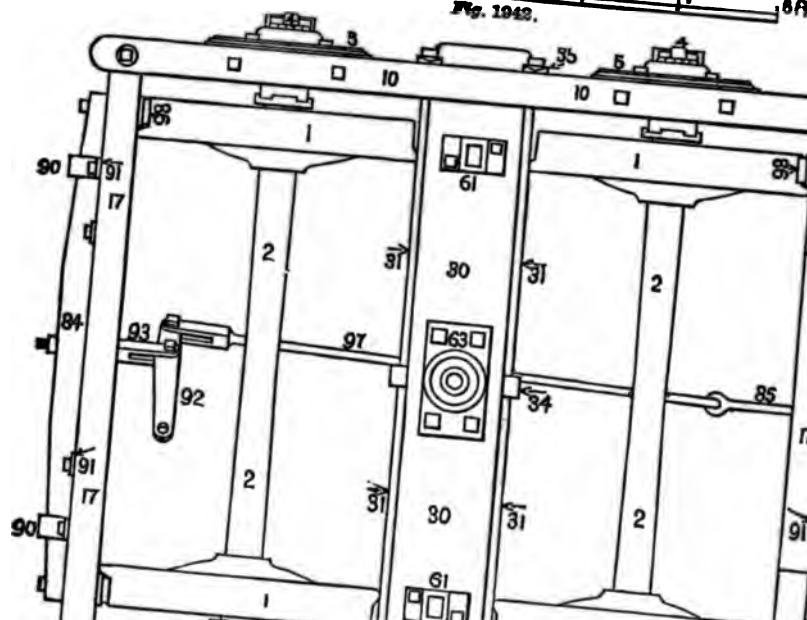
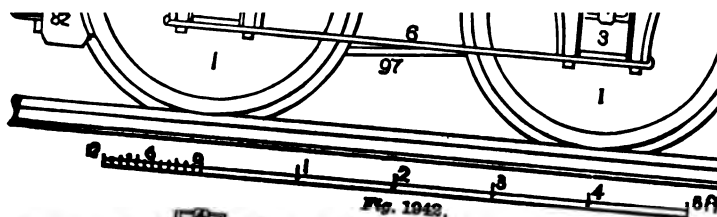
CAR TRUCKS.

COMPLETE LIST OF NAMES OF THE PARTS OF FREIGHT-CAR TRUCKS, Figs. 1907-1936.

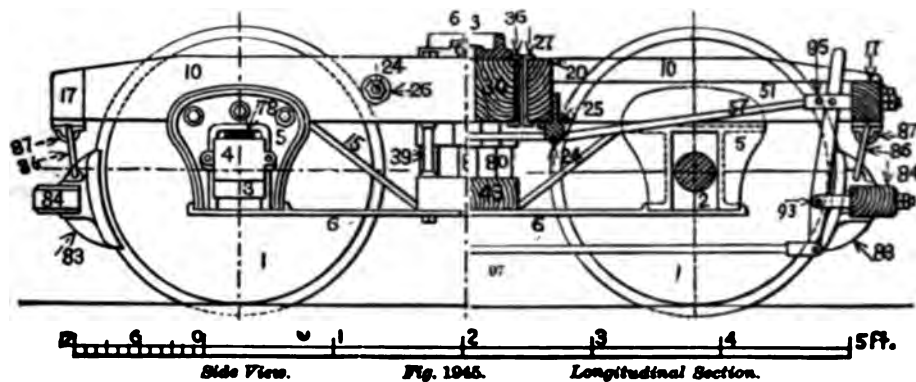
Names of parts in Roman type are special to the miscellaneous and exceptional types of freight-car trucks shown on the four following pages. Those in italics only are parts belonging to the Diamond type of truck, which is now the almost universal standard.

Numbers which are omitted from this list are for parts special to passenger car trucks, Figs. 1864-1973.

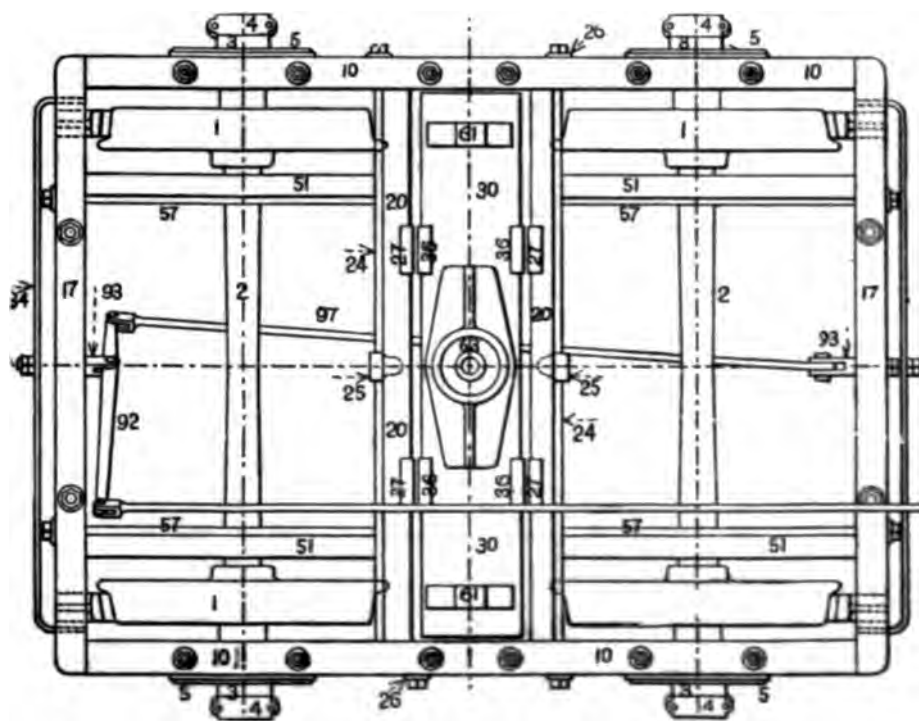
- | | | | |
|---------------------------------------|---|---|---|
| 1. <i>Wheel.</i> | 37. <i>Transom Chafing-plate.</i> | 47. <i>Upper Swing-hanger Pivot.</i> | 84. <i>Brake-beam.</i> |
| 2. <i>Axle.</i> | 38. <i>Transom-casting.</i> | 48. <i>Lower Swing-hanger Pivot.</i> | 85. <i>Brake Eye-bolt.</i> |
| 3. <i>Journal-box.</i> | 39. <i>Transom pillar.</i> | 49. <i>Swing-hanger Pivot-bearing.</i> | 86. <i>Brake-hanger.</i> |
| 4. <i>Journal-box Cover.</i> | 30. <i>Truck-bolster.</i> | 51. <i>Safety-beam.</i> | 87. <i>Brake-hanger Carrier.</i> |
| 5. <i>Pedestal.</i> | 31. <i>Truck-bolster Truss-rod.</i> | 53. <i>Axle Safety-strap.</i> | 88. <i>Brake Safety-chain.</i> |
| 6. <i>Pedestal Tie-bar.</i> | 32. <i>Truck-bolster Truss-block.</i> | 57. <i>Safety-beam Truss-rod.</i> | 89. <i>Brake Safety-chain Eye-bolt.</i> |
| 9. <i>Continuous Truck-frame.</i> | 34. <i>Truck-bolster Truss-rod Bearing.</i> | 58. <i>Safety-beam Truss-rod bearing.</i> | 90. <i>Brake Safety-strap.</i> |
| 10. <i>Wheel-piece.</i> | 35. <i>Truck-bolster Truss-rod-Washer.</i> | 61. <i>Truck Side-bearing.</i> | 91. <i>Release-spring.</i> |
| 14. <i>Arch-bar.</i> | 36. <i>Truck-bolster Chafing-plate.</i> | 63. <i>Truck Centre-plate.</i> | 92. <i>Brake-lever.</i> |
| 15. <i>Inverted Arch-bar.</i> | 37. <i>Bolster Guide-bars.</i> | 64. <i>Centre-plate Block.</i> | 93. <i>Brake-lever Fulcrum.</i> |
| 16. <i>Auxiliary Arch-bar.</i> | 38. <i>Bolster Guide-block.</i> | 74. <i>Bolster Spring-seat.</i> | 94. <i>Brake-lever Guide.</i> |
| 17. <i>End-piece, of Truck frame.</i> | 39. <i>Truck-frame Queen-posts.</i> | 75. <i>Bolster Spring-cap.</i> | 95. <i>Brake-lever Stop.</i> |
| 18. <i>Truck-frame King-post.</i> | 43. <i>Spring-plank.</i> | 76. <i>Journal-spring.</i> | 96. <i>Brake-lever Sheave.</i> |
| 20. <i>Transom.</i> | 44. <i>Spring-plank Bearing.</i> | 80. <i>Bolster-spring.</i> | 97. <i>Lower Brake-rod.</i> |
| 24. <i>Transom Truss-rod.</i> | 45. <i>Swing-hangers.</i> | 83. <i>Brake-block.</i> | 98. <i>Brake-shoe.</i> |
| 25. <i>Transom Truss-block.</i> | | 84. <i>Brake-head.</i> | 107. <i>Body Centre-plate.</i> |
| 26. <i>Transom Truss-rod Washer.</i> | | | 108. <i>Journal-box Bolts.</i> |
| | | | 109. <i>Column-bolt.</i> |



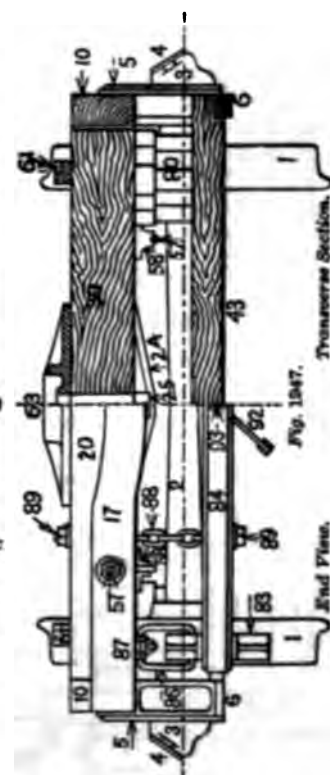
Numbers refer to List of Names of Parts on second page back.



CENTRAL RAILROAD OF NEW JERSEY.
WOODEN FREIGHT-CAR TRUCK.
(Old style; no longer built.)

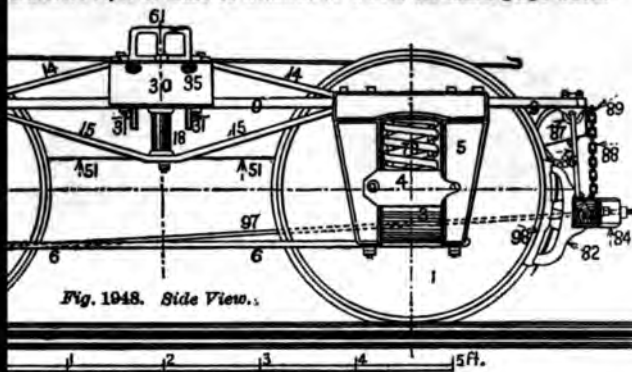


WOODEN FREIGHT-CAR TRUCK, CENTRAL RAILROAD OF NEW JERSEY.

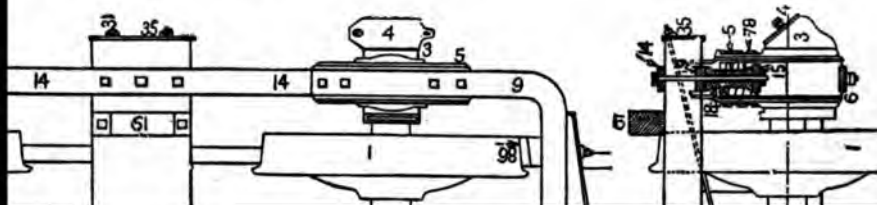


Freight-car; Miscellaneous Types.

Numbers refer to List of Names of Parts on third page back.



BOSTON & ALBANY RAILROAD
CONTINUOUS-FRAME TRUCK
STANDARD FOR FREIGHT SERVICE



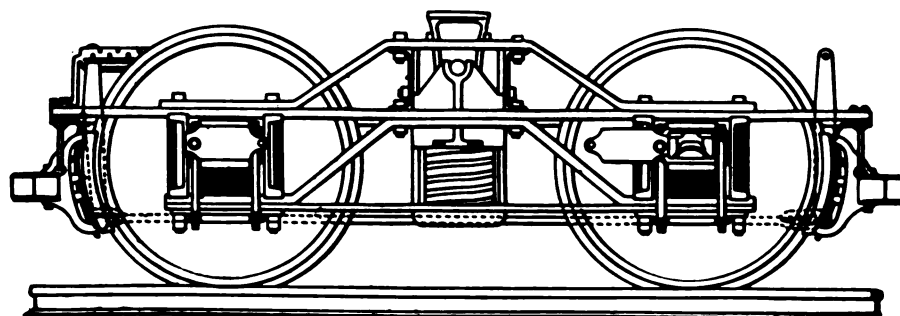


Fig. 1951. Side View.

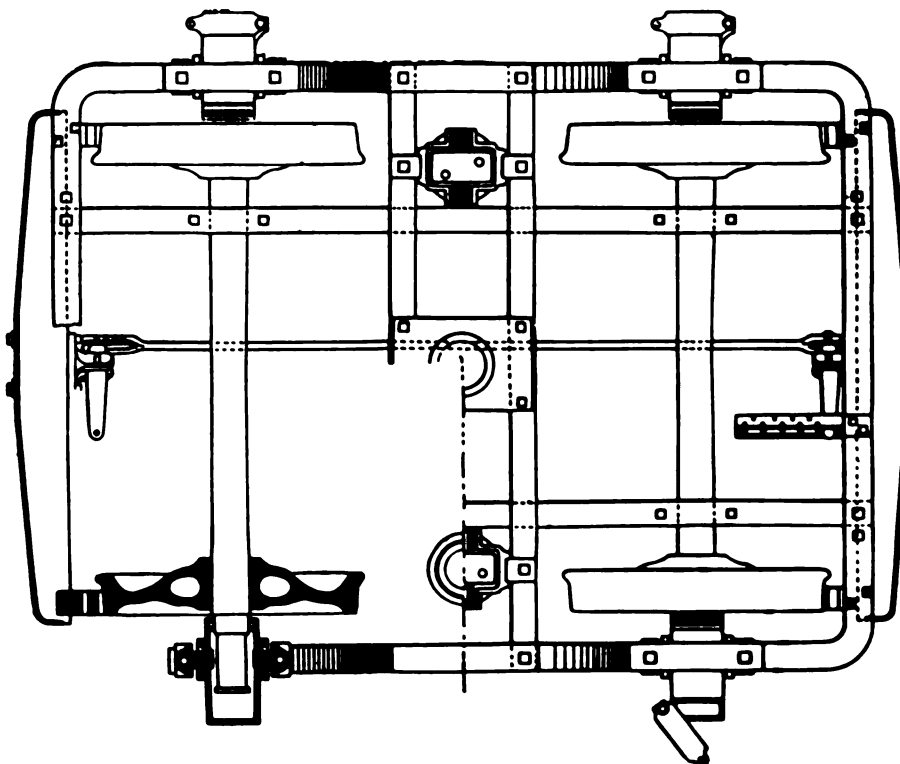


Fig. 1952. Plan.
CONTINUOUS-FRAME TRUCK, BOSTON & ALBANY RAILROAD.

BOSTON & ALBANY RAILROAD.
CONTINUOUS-FRAME TRUCK; MODIFIED
TYPE.

(Not a standard type. Names of parts are substantially the same as similar parts in truck on preceding page and elsewhere.)

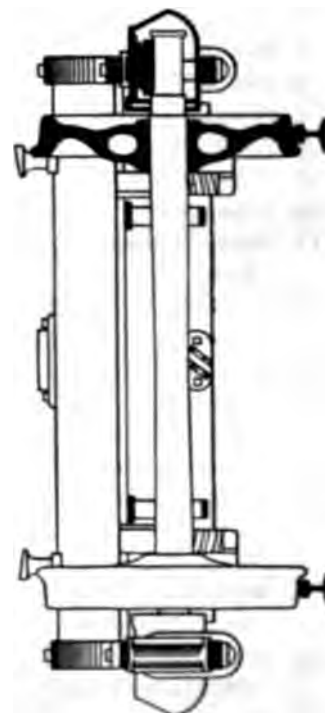


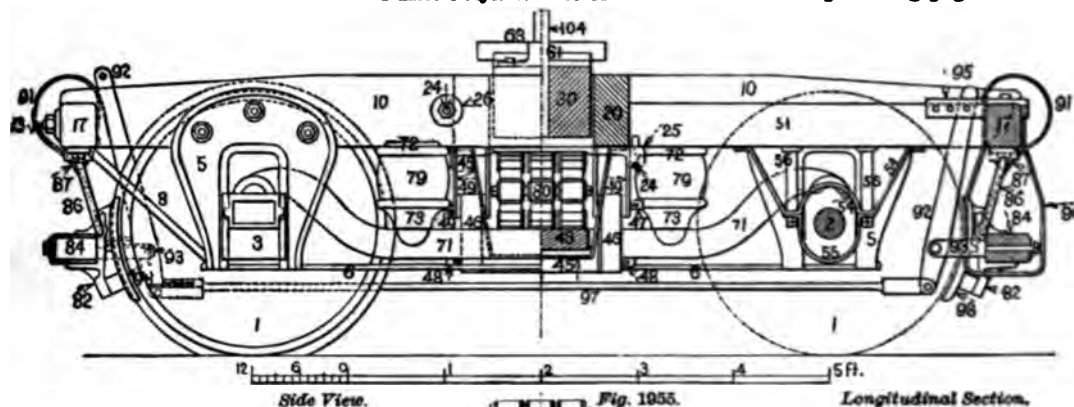
Fig. 1953. End View and Section.

T OF NAMES OF PARTS OF PASSENGER-CAR TRUCKS; *Figs. 1955-1973.*

ial to SIX-WHEEL car-trucks. Numbers which are omitted from this list are for parts special to fre
car trucks, shown on the pages immediately preceding.)

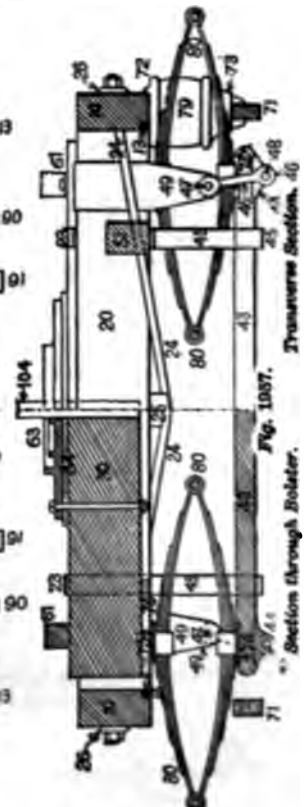
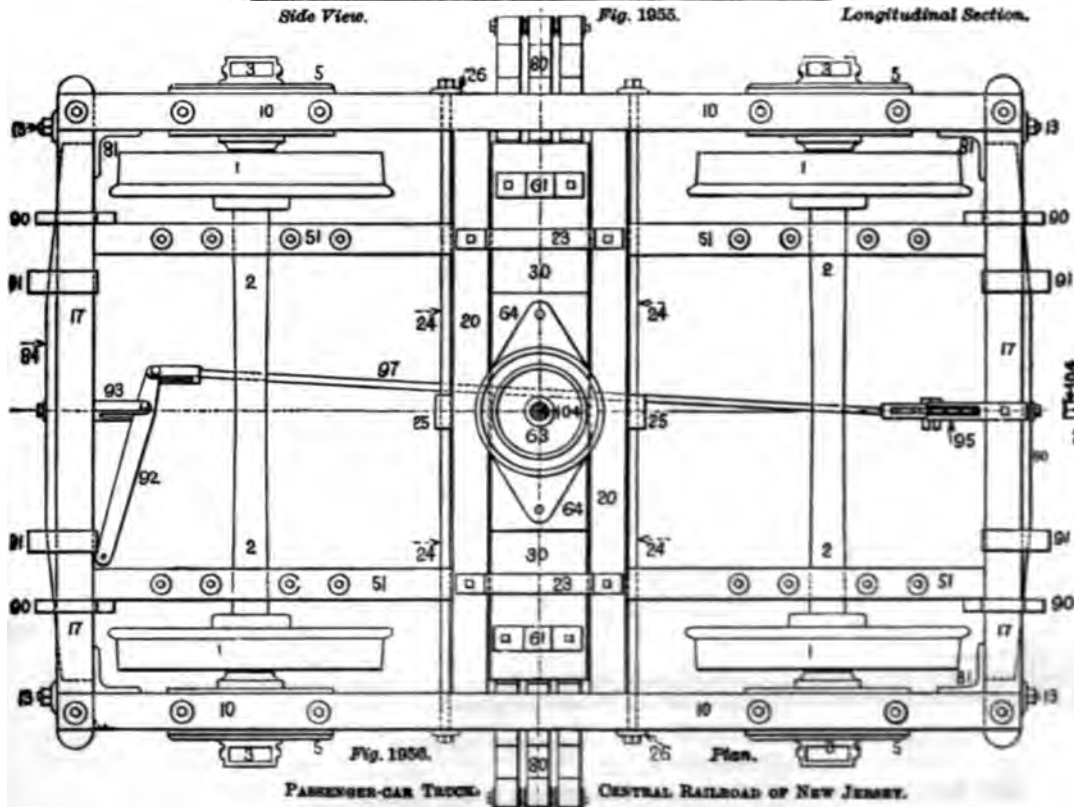
Transom Truss-rod	54. Axle Safety-bearing.	80. Bolster-spring.
Washer.	55. Axle Safety-strap.	81. Truck-frame Knee-i
Transom Chafing-plate.	56. Axle Safety-bearing	82. Brake-block.
Transom-casting.	Thimbles.	83. Brake-head.
Transom-pillar.	59. Safety-beam Tie-rod.	84. Brake-beam.
Truck-bolster.	60. Safety-beam Iron.	85. Brake Eye-bolt.
Truck-bolster Chafing- plate.	61. Truck Side-bearing.	86. Brake-hanger.
Lateral-motion Spring.	62. Side-bearing Bridge.	87. Brake-hanger Carri
Lateral-motion Spring-	63. Truck Centre-plate.	88. Brake Safety-chain.
	64. Centre-plate Block.	89. Brake Safety-chain

Numbers refer to List of Names of Parts on preceding page.



CENTRAL RAILROAD OF NEW JERSEY.

STANDARD PASSENGER-CAR TRUCK.



Passenger-car; *Four-wheel.*

Numbers refer to List of Names of Parts on second page back.

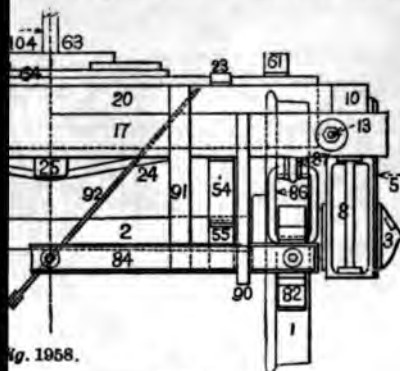


Fig. 1958.

End View.

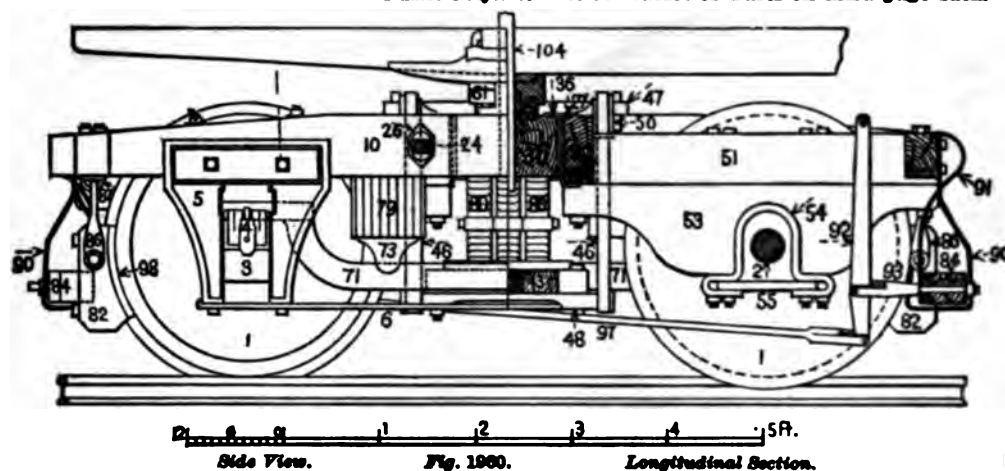
CENTRAL RAILROAD OF NEW JERSEY.

CHICAGO, BURLINGTON & QUINCY RAILROAD.

ALLEN IRON PASSENGER-CAR TRUCK.

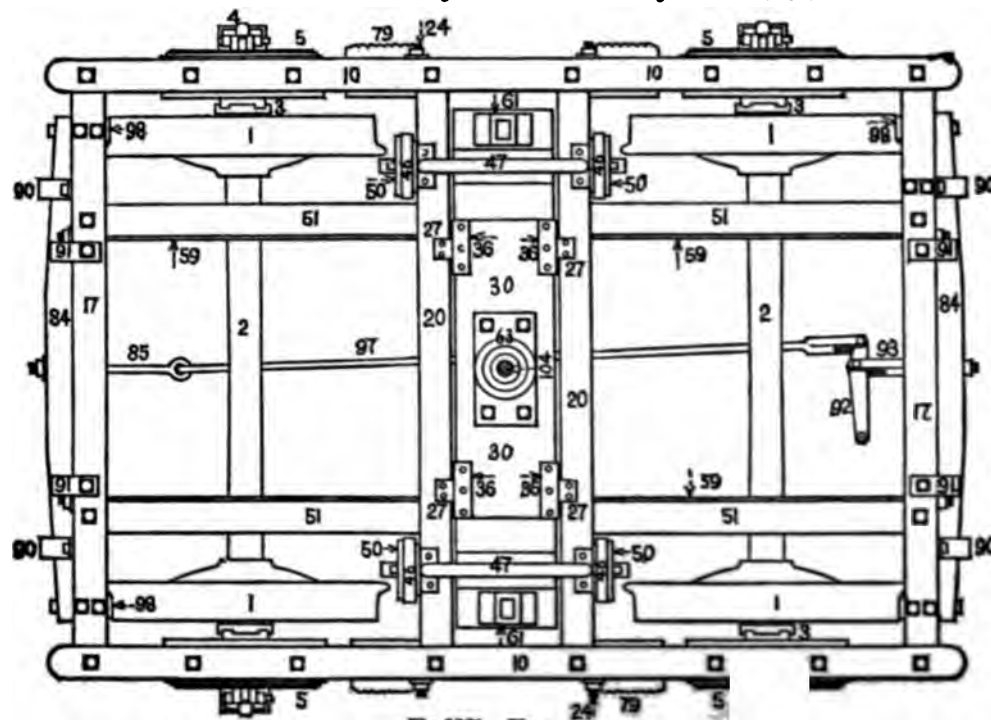
(Old style; no longer built.)

Numbers refer to List of Names of Parts on third page back.

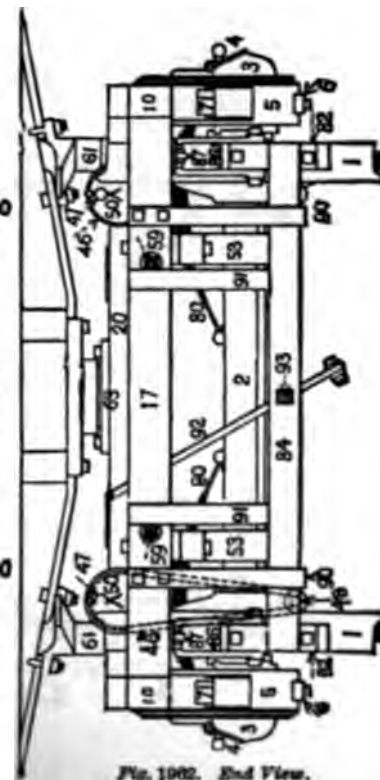


NEW YORK & HAVEN
RAILROAD.

STANDARD PASSENGER-CAR
TRUCK.



PASSENGER-CAR TRUCK, 1



Passenger-car; *Four-wheel.*

Numbers refer to List of Names of Parts on fourth page back.

PENNSYLVANIA RAILROAD
STANDARD PASSENGER-CAR

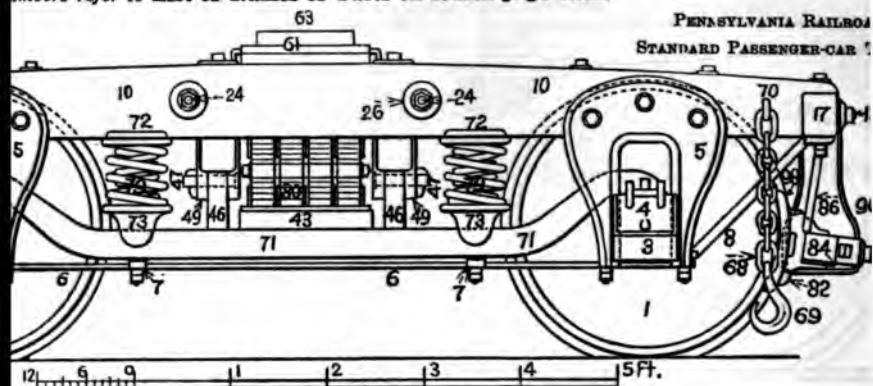
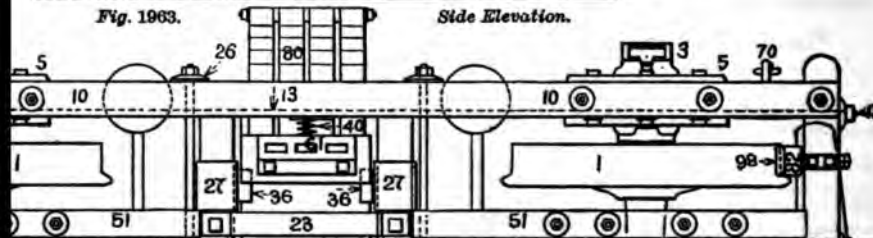


Fig. 1963.

Side Elevation.



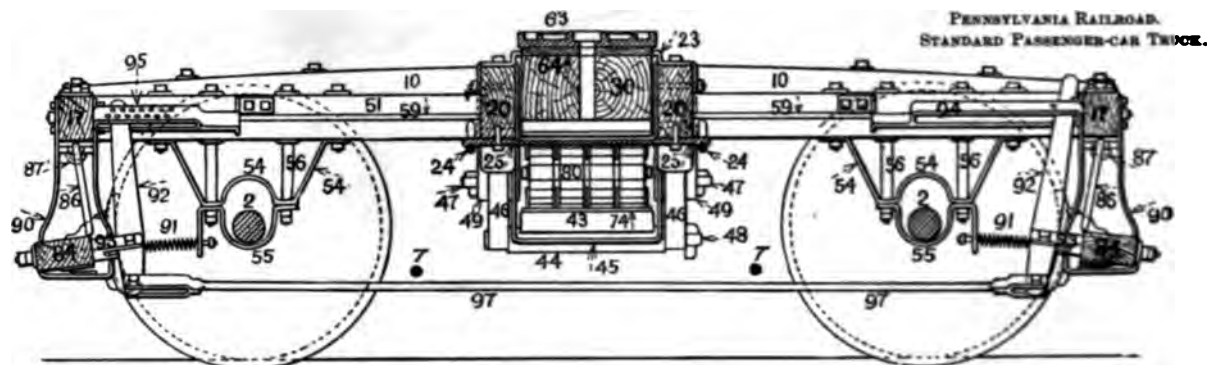


Fig. 1965. Longitudinal Section.

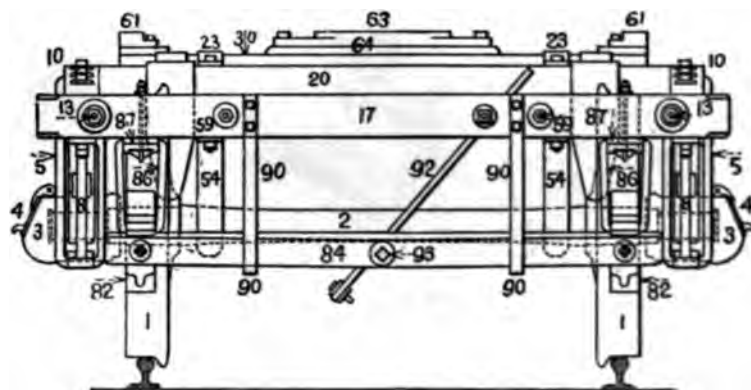
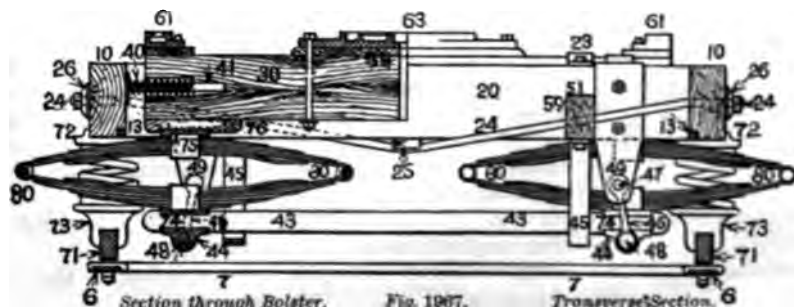


Fig. 1966. End View.

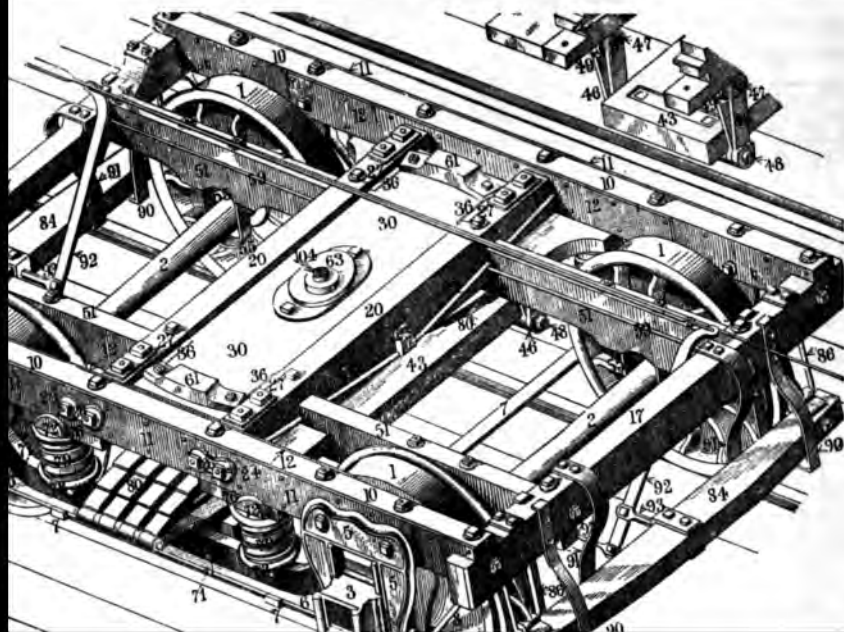


PASSENGER-CAR TRUCK, PENNSYLVANIA RAILROAD.

(The centre-plate shown in these engravings, Figs. 1963 to 1967, is no longer used, the "Pullman" centre-plate, Figs. 2107-09, being used instead.)

(The LOWER BRAKE-ROD, 97, passes under the PEDIMENTAL STAY-ROD, 7, at the bottom of Fig. 1967 and is supported by a LOWER BRAKE-ROD CARRIER, but neither the rod nor the carrier are shown.)

enger-car; *Four-wheel*



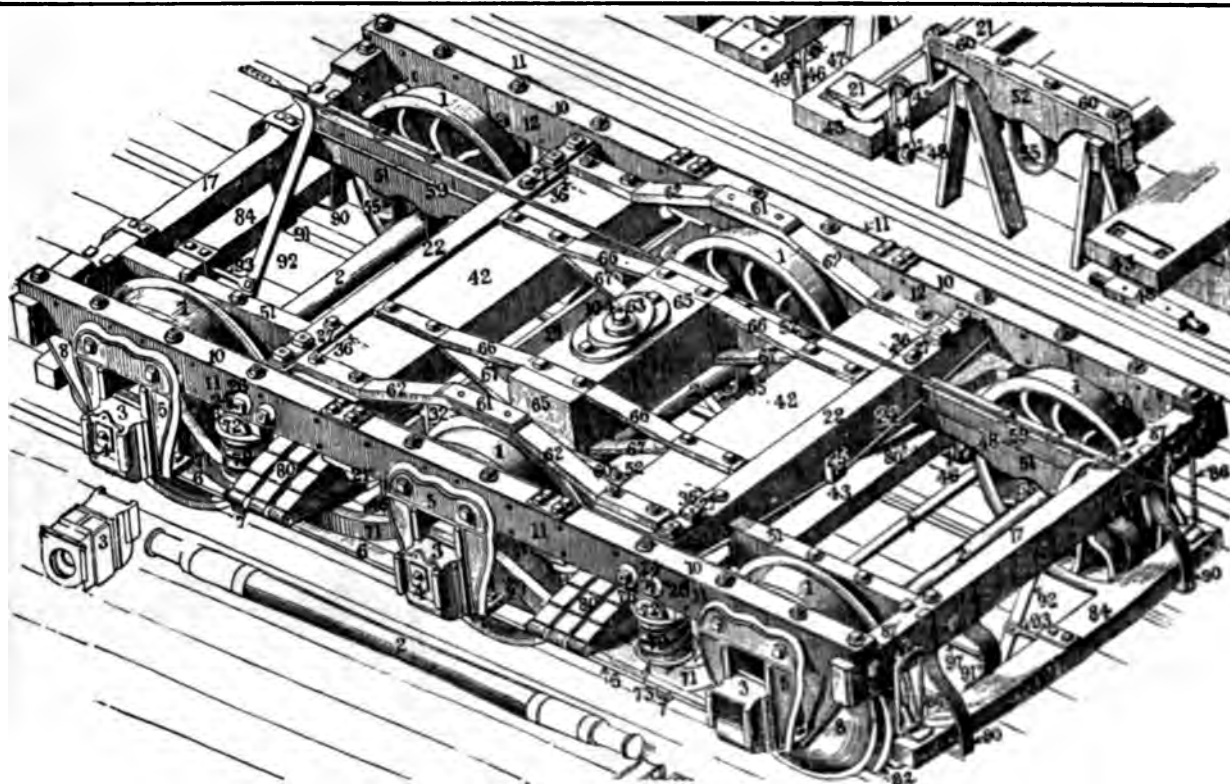


Fig. 1969. SIX-WHEEL PASSENGER-CAR TRUCK. PULLMAN PALACE CAR COMPANY. Perspective View.

- 72. Equalizing-bar Spring-cap.
- 73. Equalizing-bar Spring-seat.
- 76. Spring-block.
- 77. Jaw-bit (Fig. 2025 only).
- 79. Equalizing-bar Spring.
- 80. Bolster-spring.
- 82. Brake-block.

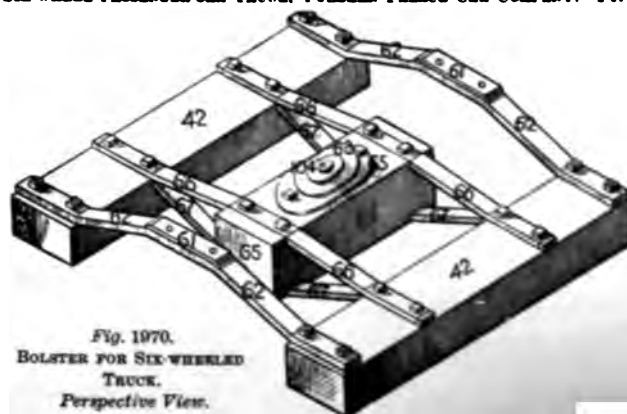


Fig. 1970.
BOLSTER FOR SIX-WHEELED
TRUCK.
Perspective View.

- 84. Brake-beam.
- 86. Brake-hanger.
- 87. Brake-hanger Carrier.
- 90. Brake Safety-strap.
- 91. Release-spring.
- 92. Brake-lever.
- 93. Brake-lever Fulcrum.
- 97. Lower Brake-rod.
- 104. King-bolt, or Centre-pin.

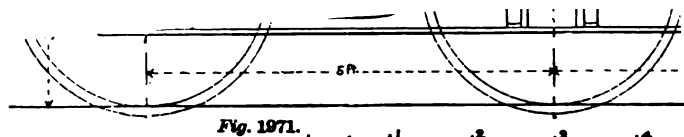
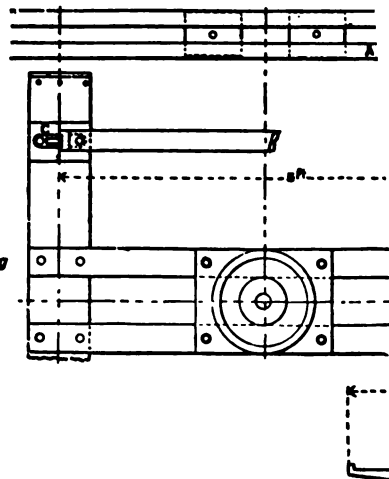


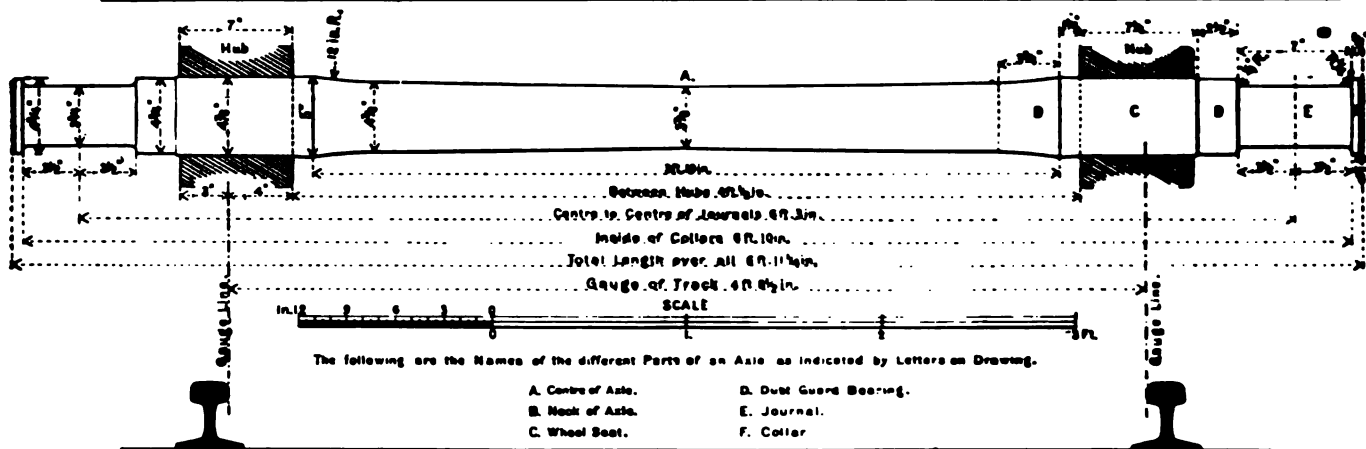
Fig. 1971. SIX-WHEEL IRON TRUCK FOR 60-FT. PARLOR CARS, PHILADEL.



NAMES OF PARTS; Figs. 1971-78.

(Figures in parentheses refer to corresponding parts on previous page.)

- A.** (11) *Outside Wheel-bars.*
- A₁.** (17) *End-piece.*
- A₂.** (51) *Safety-beam.*
- B.** (42) *Spring-beam (iron).*
- B₁.** (66-7) *Centre-bearing Arch-bars and Centre-bearing Inverted Arch-bar.*
- C.** (61) *Truck Side-bearing.*
- F.** *Body-bolster Truss.*
- G.** (1. Fig. 220.) *Double Iron Body-bolster.*
- L.** (83) *Brake-head.*
- L₁.** (86) *Brake-hanger.*
- L₂.** (90) *Brake Safety-strap.*



The engraving represents the dimensions of the axle when finished. Weight, finished, 347 lbs.

Fig. 1974. MASTER CAR-BUILDERS' STANDARD AXLE. (Old Standard.)

(Adopted in 1870, and approved by both Master Car-Builders' and Master Mechanics' Associations.)

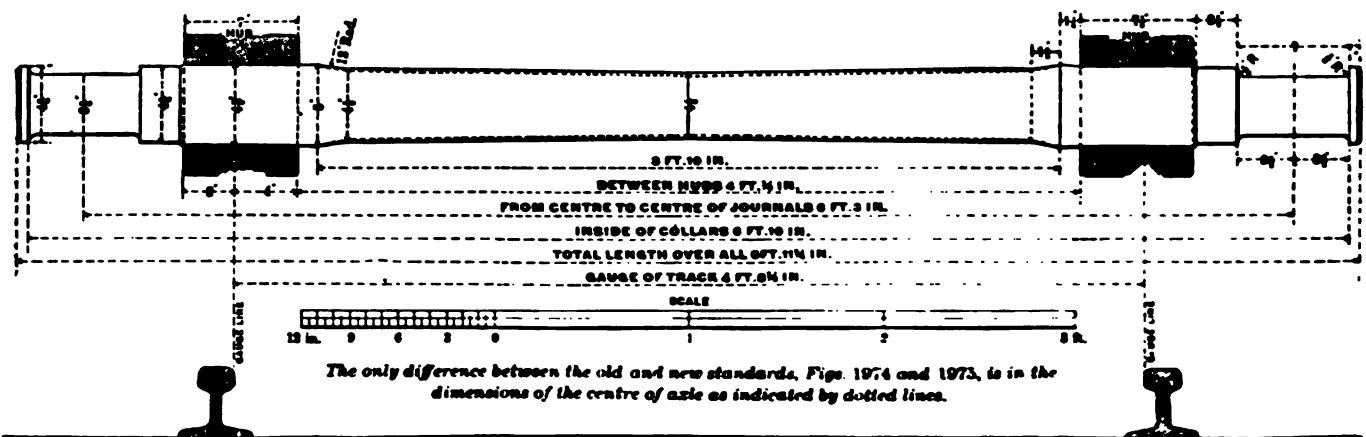


Fig. 1975. MASTER CAR-BUILDERS' STANDARD AXLE. (New Standard.)

Adopted by Master Car-Builders' Association 1884, and approved by letter ballot. Not yet (1884) acted on by Master Mechanics' Association.)



Fig. 1976. HUBBARD AXLE.

(Names of parts, same as in Fig. 1974, the COLLAR, F, is



Fig. 1977.
COMBINED BRAKE-SHOE AND HEAD.
(Showing dovetail-joint and "Standard" split-key.)



Fig. 1978.
BRAKE-HEAD.
(Average wt., 10 lbs.)

"STANDARD" BRAKE-SHOE AND HEAD





Fig. 1982.
PERSPECTIVE VIEW OF JOURNAL-BEARING.



Fig. 1983.
JOURNAL-BEARING KEY.
(These drawings, Figs. 1983-4, are not precisely the M. C. B. standards.)



Fig. 1984.
JOURNAL-BEARING.

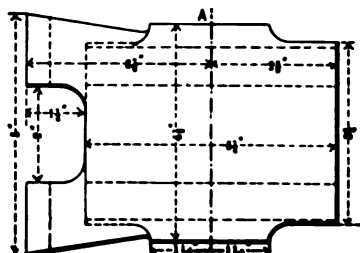


Fig. 1985.
PLAN OF KEY.



Fig. 1986.
TRANSVERSE SECTION OF KEY ON
LINE A.

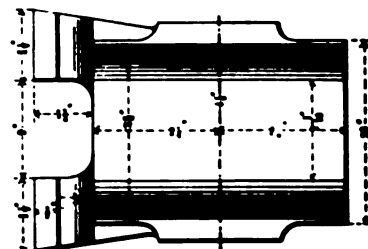


Fig. 1987.
INVERTED PLAN OF KEY.
(This drawing incorrectly represents the
sloping interior faces of the key as curved.
See section.)

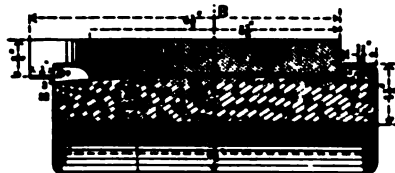


Fig. 1988.
LONGITUDINAL SECTION OF KEY AND
BEARING.

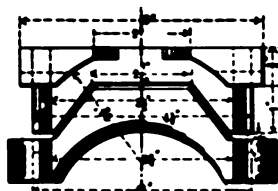


Fig. 1989.
OUTSIDE END VIEW OF BEARING
AND KEY.

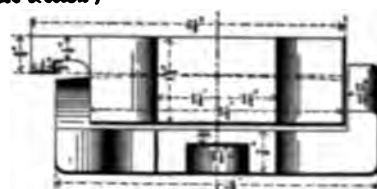


Fig. 1990.
SIDE VIEW OF BEARING AND KEY.

Weight of Bearing, 9 lbs.

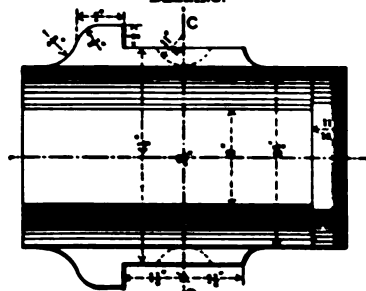


Fig. 1987.
PLAN OF BEARING.

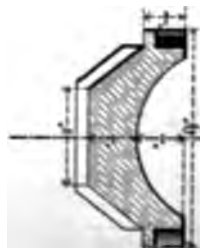


Fig. 1989.
TRANSVERSE SECTION OF BEAR-
ING ON LINE C D.



(This Standard was adopted at the Eighth
Annual Convention, Cincinnati, 1874. Action
reaffirmed at Eleventh Annual Convention,
1878.)

MASTER CAR-BUILDERS' STANDARD JOURNAL-BEARINGS AND KEYS

K DETAILS, Journal Bearings.



Longitudinal Section.

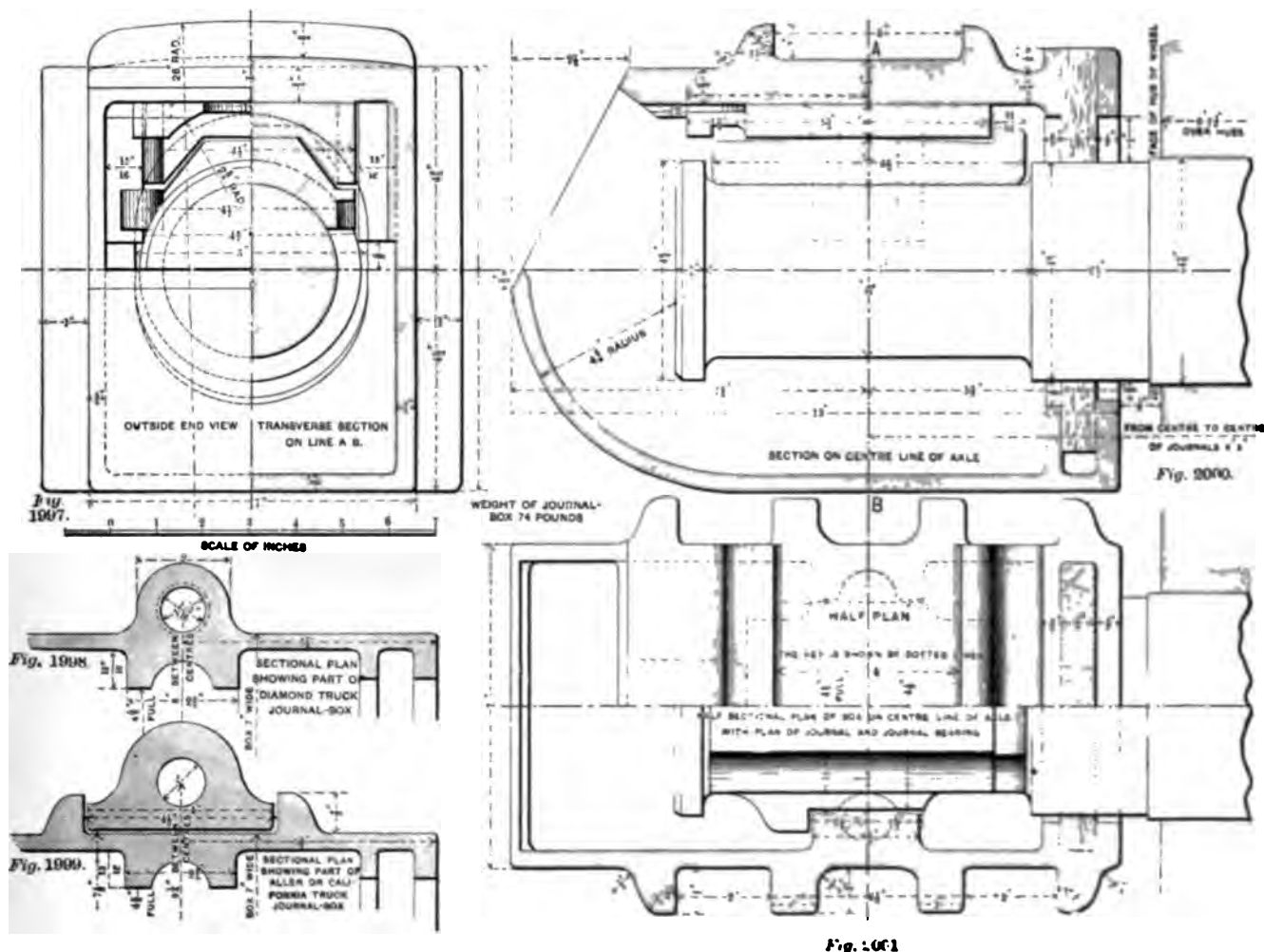


Fig. 1984. Cross Section.

HOPKINS LEAD-LINED OR SELF-FITTING JOURNAL-BEARING.

A B. Lead-lining.

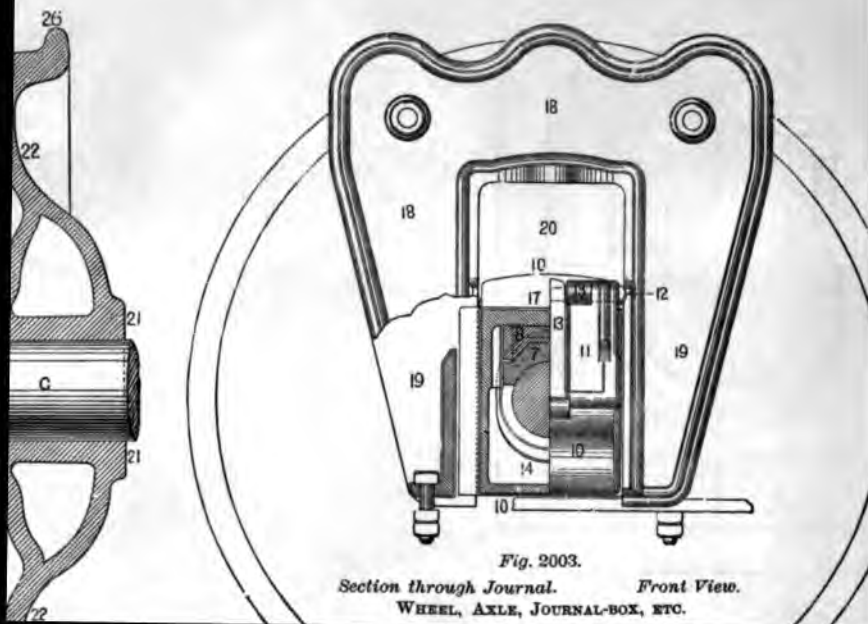




MASTER CAR-BUILDERS' STANDARD JOURNAL-BOX.—PLANS SHOWING JOURNAL, JOURNAL-BEARING AND KEY.

(This standard was adopted at the Eighth Annual Convention, Cincinnati, 1874. Action reaffirmed at Fifth Convention, New York, 1881. Standard Pedestal, Figs. 2021-24.)

TAILS, Journal Boxes, etc.



Numbers refer to List of Names of Parts on preceding page.

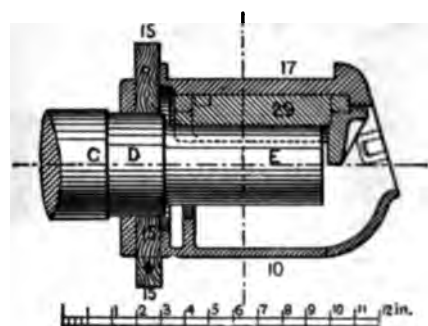


Fig. 2004. Section.
WRIGHT'S STOP JOURNAL-BEARING.

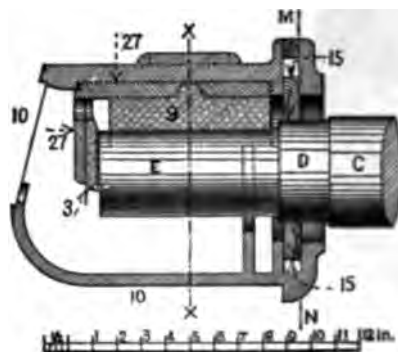


Fig. 2005. Section.
BISSSEL'S STOP-KEY JOURNAL BEARINGS.

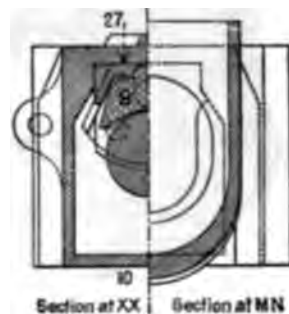


Fig. 2006.



Fig. 2007. Plan.

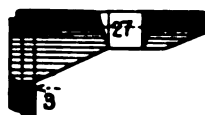


Fig. 2008. Side View.
BISSSEL'S JOURNAL-BEARING STOP-KEY.

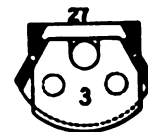


Fig. 2009. Back End View.

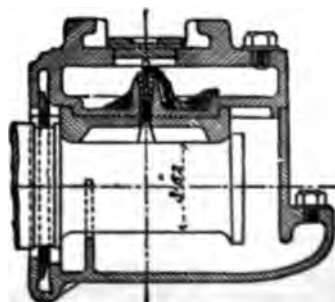


Fig. 2010. Section.
TOP-RESERVOIR JOURNAL-BOX.

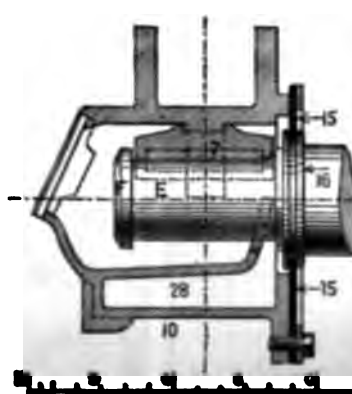


Fig. 2011. Section.

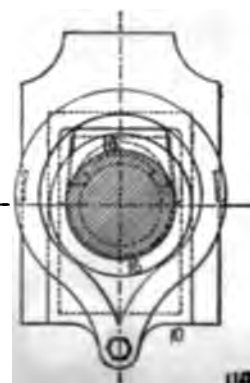


Fig. 2012. Back View.

Telford's Journal-box.

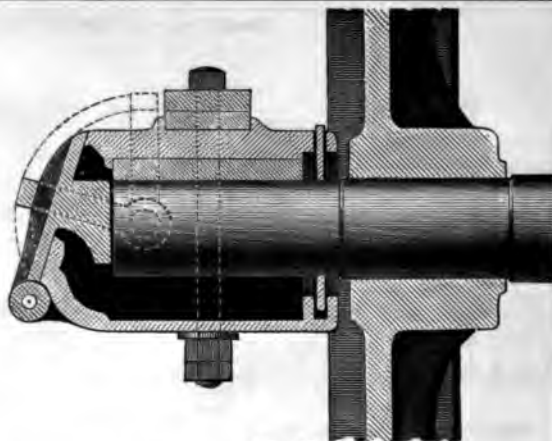
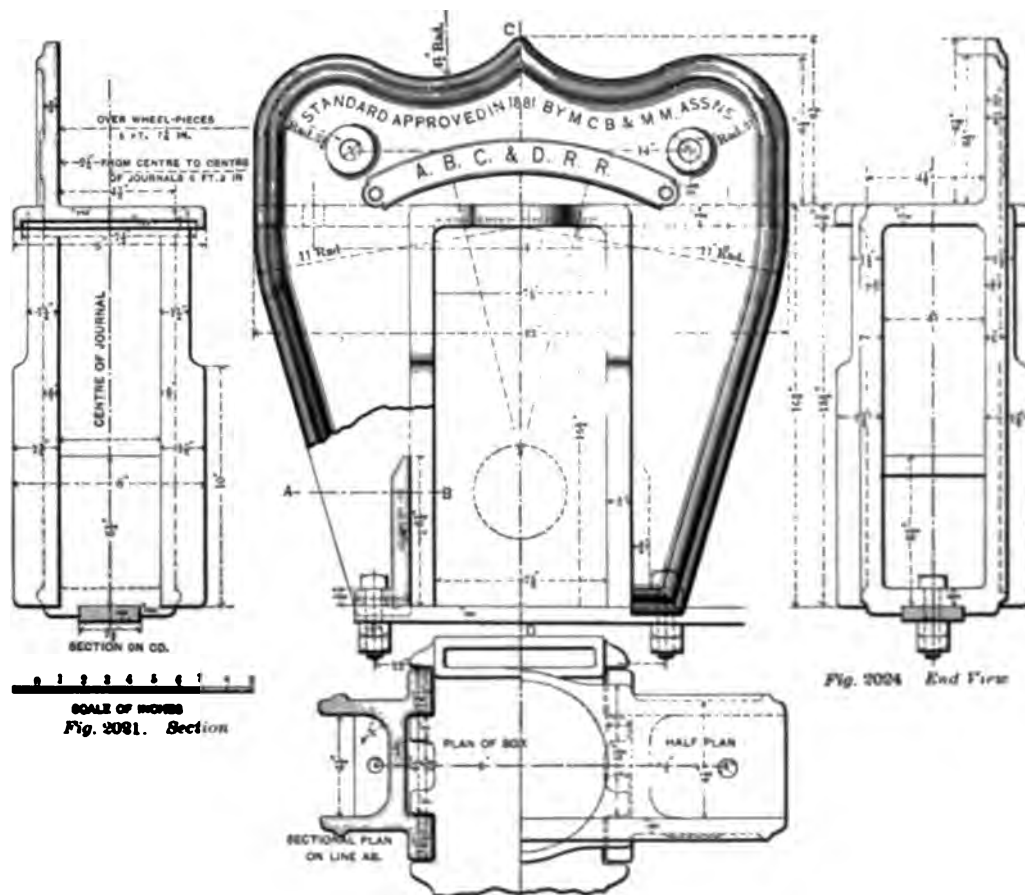


Fig. 2014.

RAOUL JOURNAL-BOX. Showing YOKE or BAIL and END-STOP.
(A sliding cap instead of the yoke is also used, which raises vertically and sits in a recess, for packing and oiling, but falls of its own gravity into place when jarred.)



Figs. 2092-2093.
Elevation and Plan.

MASTER CAR-BUILDERS' STANDARD PEDESTAL.

(This standard was adopted at the Eighth Annual Convention, Cincinnati, 1874. Action reaffirmed at Fifteenth Annual Convention, New York, 1881.)

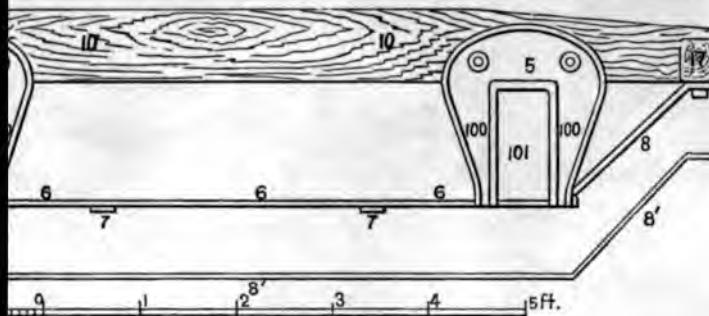


Fig. 2025. Side View.

SIDE-FRAME OF WOODEN CAR-TRUCK.

NAMES OF PARTS; *Fig. 2025.*

- 8. *Pedestal-brace.*
- 8'. *Pedestal-brace Tie-bar.*
- 10. *Wheel-piece.*
- 17. *End-piece, of Truck-frame.*

- 77. *Jaw-bit.*
- 100. *Pedestal-horns.*
- 101. *Pedestal-jaw.*



Fig. 2031. HALF ELLIPTIC SPRING.
1. Spring-band. 2. Set, or Arch.

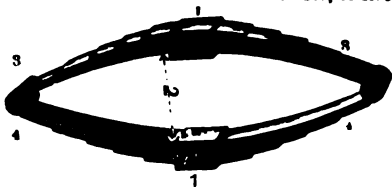


Fig. 2032. ELLIPTIC SPRING.
1. Spring band. 2. Set, of Spring. 3. Scroll. 4. Eye-bolt.
— Length is understood to be from centre to centre of scrolls when unloaded.
— Arch is half the set.



Fig. 2034. DOUBLE ELLIPTIC SPRING, for freight service.



Fig. 2033.
TRIPLE ELLIPTIC SPRING,
for passenger service.

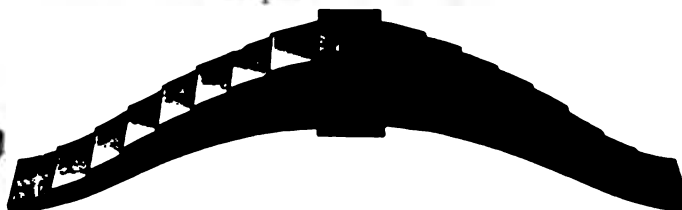


Fig. 2035. HALF-ELLIPTIC BOLSTER-SPRING, for freight service.

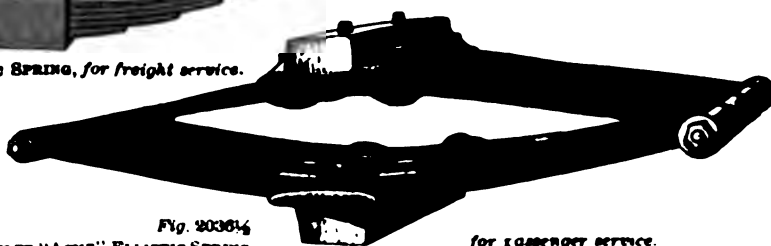


Fig. 2036 1/2
TRIPLET "ACME" ELLIPTIC SPRING,
for passenger service.

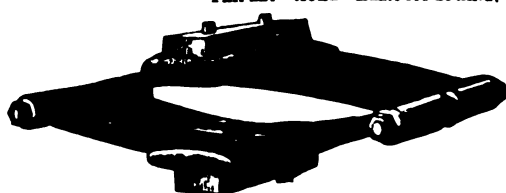


Fig. 2036. DOUBLE, OR DUPLICATE "ACME" ELLIPTIC SPRING, for freight service.
(This spring, Figs. 2036-2036 1/2, has a single leaf, tapered, and is the original form of "Acme" Spring. See Figs. 2138-9.)



Fig. 2037. CONCAVE ELLIPTIC SPRING.
(36 in. x 1 1/4 in. high, 6 leaves; main, 3 x 1/4 in.; others, 3 x 3/16 in. Weight, 183 lbs. Capacity, 6,500 lbs. half exhausted.)

According to the number of single springs coupled together elliptic springs are designated as DOUBLE or DUPLICATE, TRIPLE or TRIPLET, QUADRUPLER, QUINTUPLER, and SEXTUPLER.



IMPROVED ACME " ELLIPTIC SPRING, TRIPLET, for passenger service.

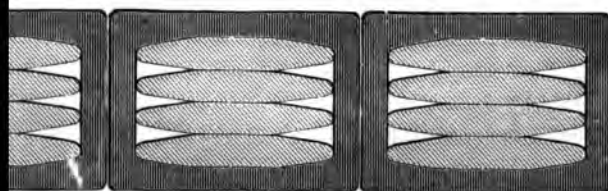


Fig. 2039. Section of Fig. 2038 (one-fourth full size).

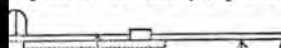




Fig. 2042.
INDIA-RUBBER SPRING.



Fig. 2043.
COMPOUND SPIRAL-SPRING.



Fig. 2044.
RUBBER-CENTRE SPIRAL-SPRING.
3. Spring-seat. 4. Spring-cap.



Fig. 2045.
"VOSE" GRADUATED SPIRAL-SPRING.
3. Spring-seat. 4. Spring-cap.



Fig. 2046.
EIGHT-GROUP WOOL-PACKED SPIRAL-SPRING.



Fig. 2047.
OUTSIDE-VIEW OF SPRING-CASE FOR EIGHT-
GROUP WOOL-PACKED SPIRAL-SPRING.



Fig. 2048.
SMALL RUBBER-CENTRE
SPIRAL-SPRING.

(All forms of Springs shown on this page are now rarely, if ever, used.)



Fig. 2050.
FLAT SPIRAL-SPRING.



Fig. 2051.
SPOOL-SHAPED SPIRAL-SPRING.



Fig. 2052.
VOLUTE SPRING.



Fig. 2056.
ROUND-BAR SINGLE-COIL
SPIRAL SPRING.



Fig. 2057.
ROUND-BAR DOUBLE-COIL
SPIRAL SPRING OR NEST-SPRING.



Fig. 2058.
ROUND-BAR TRIPLE-COIL
SPIRAL SPRING OR NEST-SPRING.



Fig. 2059.
HALF-ROUND DOUBLE-COIL SPIRAL SPRING OR
NEST-SPRING.



Fig. 2060.
Section.



Fig. 2061.
FLAT-BAR OR EQUAL-BAR TRIPLE-
COIL SPIRAL SPRING OR
NEST-SPRING.



Fig. 2062.
"HIBBARD" OR FLAT-BAR QUADRUPLE-
COIL NEST-SPRING.



Fig. 2063.
EIGHT-COILED SPIRAL SPRING.



Fig. 2063 1/2.
"PARAGON" SPIRAL SPRING.
(Little used.)



Fig. 2064 1/4.
SQUARE-BAR TRIPLE-COIL
NEST-SPRING.



Fig. 2065.
"DINSMORE" SPIRAL SPRING.



Fig. 2066.
Section of Fig. 2063.



Fig. 2064.
Section of Fig. 2063 1/2.

3. Spring-seat. 4. Spring-cap.



Fig. 2067. SINGLE-COIL EQUALIZER-SPRING.



Fig. 2068.

DOUBLE-COIL EQUALIZER-SPRING.



Fig. 2069. TRIPLE-COIL EQUALIZER-SPRING.



Fig. 2070. DOUBLE-COIL BOLSTER-SPRING.

Two-group
Spiral Springs,
Showing SPRING-PLATES,
or Spring-seats and
Spring-caps.

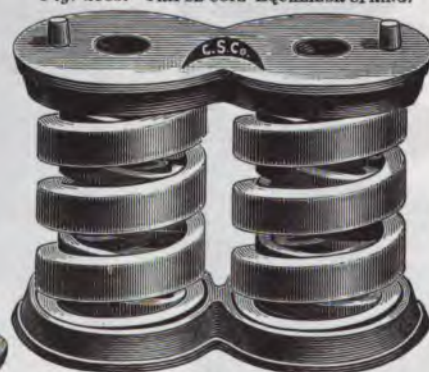


Fig. 2071. TRIPLE-COIL FLAT-BAR BOLSTER-SPRING.



Fig. 2072. EDGE-ROLLED BOLSTER-SPRING.



Fig. 2073.
ROUND-BAR BOLSTER-SPRING
(for 15-ton car.)

Three-group
Spiral Springs.



Fig. 2074.
EDGE-ROLLED BOLSTER-SPRING
(for 15-ton car.)



Fig. 2075.
DOUBLE-COIL FLAT-BAR
BOLSTER-SPRING
(for 10-ton car.)



Fig. 2076. DOUBLE-COIL ROUND-BAR BOLSTER-SPRING
(for 20-ton car, 6 to 8 in. high.)

Four-group
Spiral Springs,
Showing SPRING-
PLATES, or Spring-
seats and Spring-
coils.



Fig. 2077.

DOUBLE-COIL FLAT-BAR BOLSTER-SPRING (for 15-ton car.)



R BOLSTER-SPRING.



Fig. 2070. SIX-GROUP SINGLE-COIL ROUND-BAR BOLSTER-SPRING.



Five-group to Eight-group Spiral Springs,



Nine-group to Eleven-group Spiral Springs,
Showing SPRING-PLATES, or Spring-seats and Spring-caps.



Fig. 2083. NINE GROUP SINGLE-COIL BOLSTER-SPRING.



Fig. 2084. NINE-GROUP BOLSTER-SPRING.



Fig. 2085. TEN-GROUP BOLSTER-SPRING.
(For 20-ton car; 6 1/4 in. high)



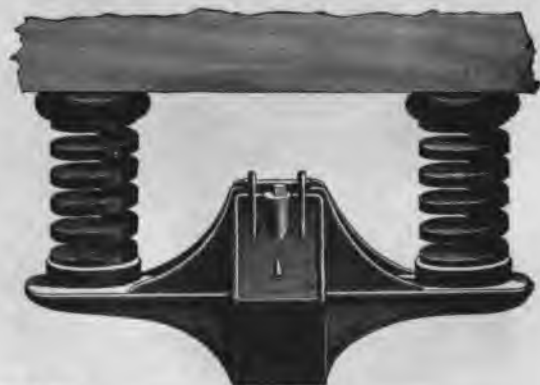
Fig. 2086. TEN-GROUP BOLSTER-SPRING.



Fig. 2087. TEN-GROUP DOUBLE-COIL BOLSTER-SPRING.
(For 20-ton car; 6 1/4 in. high.)

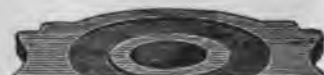
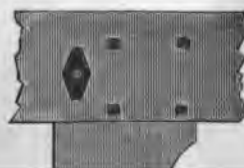


Fig. 2088. ELEVEN-GROUP BOLSTER-SPRING.



PEDESTAL-SPRINGS FOR STREET CARS.

Fig. 2090.



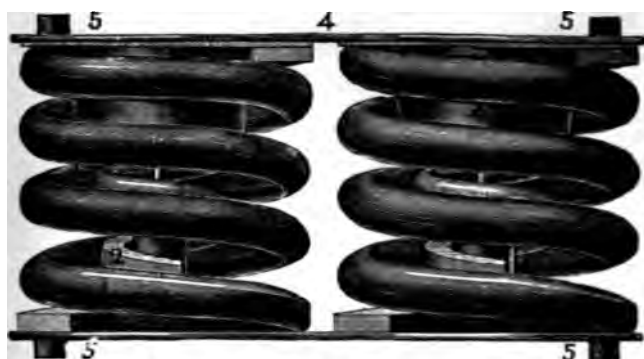


Fig. 2095. Side Elevation.

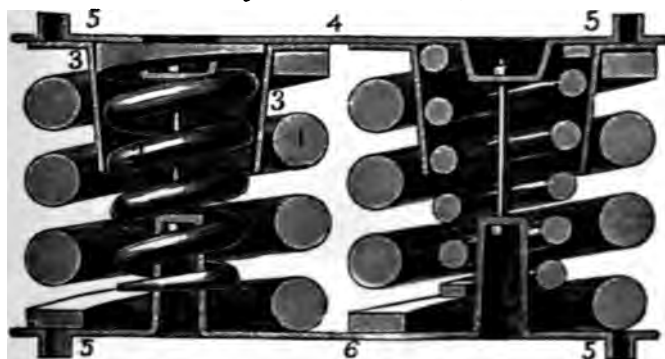


Fig. 2096. Section.

GRADUATED TWO-GROUP BOLSTER-SPRING (for 25-ton car)
 Motion, $\frac{1}{4}$ in. per 1,000 lbs. to 6,000 lbs. Height, 6 $\frac{1}{2}$ in. to 45-16 in.
 1-16 in. " " 6,000 to 26,000 lbs. " " 1-16 in. total motion.



Another graduated spring is shown in Fig. 2054.

Fig. 2098. GRADUATED THREE-GROUP BOLSTER-SPRING.
 Size, 11 $\frac{1}{4}$ x 7 in. Weight, 86 $\frac{1}{2}$ lbs. Capacity, graduated from 4,000 lbs. to 26,000 lbs. Total motion, 1 9-16 in.

NAMES OF PARTS; Figs. 2095-6.

1. Outer-coil.
2. Inner-coil (and in Fig. 2096 only, Lower Cone).
3. (Fig. 2095) Outer Cone.
4. (Fig. 2096) Spring-cap. or Upper Spring-plate.
5. Spring-plate Lugs.
6. Spring-seat, or Lower Spring-plate.

Graduated Springs.



Fig. 2097. TRIPLE-COIL GRADUATED EQUALIZER SPRING.

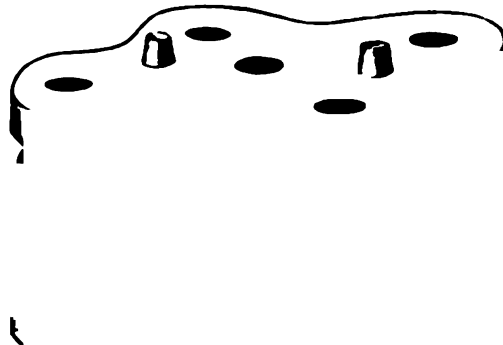


Fig. 2099. Gr
 Size, 10 x 7

" GRADUATED-SPRING.
 1 to 40,000 lbs.

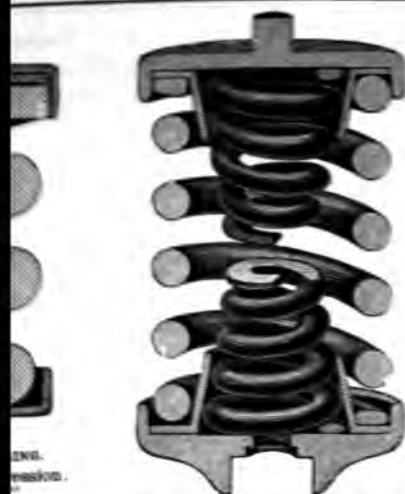


Fig. 2101. DOUBLE-COIL GRADUATED
EQUALIZER-SPRING.



Fig. 2102.
DOUBLE-COIL GRADUATED BOLSTER-SPRING.



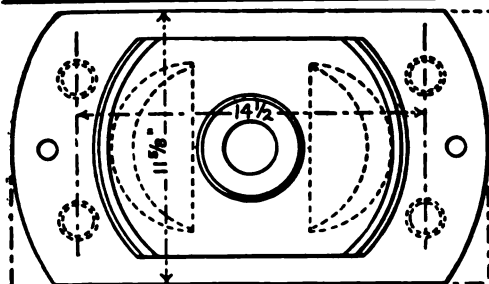


Fig. 2107.
Body Centre-plate.

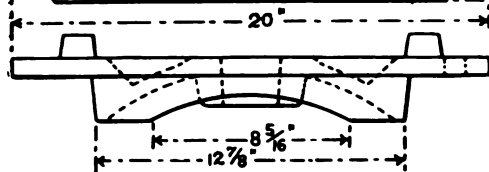


Fig. 2108.
Section of both
Centre-plates.

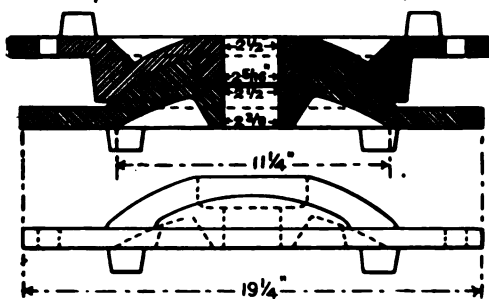


Fig. 2109.
Truck Centre-plate.

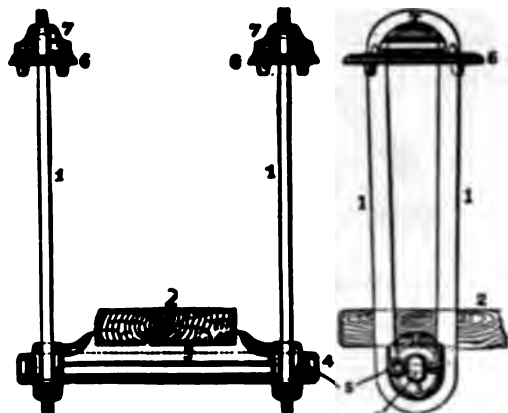
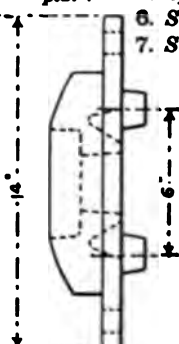
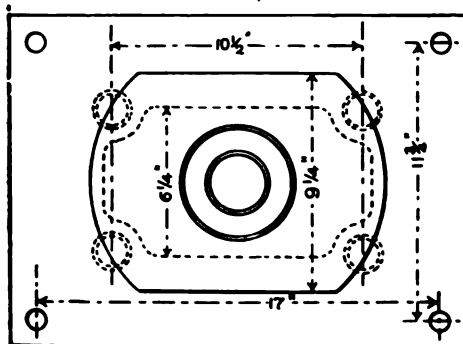


Fig. 2110.
SWING-LINKS AND ATTACHMENTS, LAKE SHORE & MICHEGAN
SOUTHERN RAILWAY AND COASTAL LINES.

NAMES OF PARTS : Figs. 2110-11.

1. Swing Link-hanger.
2. Spring-plank.
3. (Fig. 2110) Cross-bar Casting, or Spring-plank Carrier.
3. (Fig. 2111) Swing-hanger Friction-washer (lower).
4. Cross-bar, or Mandrel-pin.
5. Split-key.
6. Swing-hanger Upper Bearing.
7. Swing-hanger Friction-washer (upper).

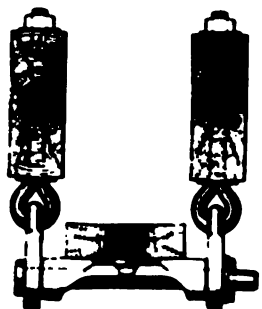


Fig. 2112. Cross-section.

NAMES OF PARTS : Figs.
2112-13.

- Link-hanger Eye-bolt.
Link-hanger.

(Other parts as in Figs. 2110-11.)

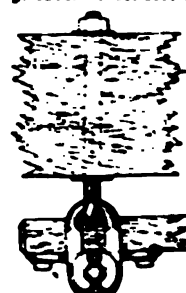


Fig. 2113. Side View.
EYE-BOLT LINK-HANGER.
(A SAFETY-SCREW, not shown, is
attached to the transverse end
piece under the spring-
plank.)

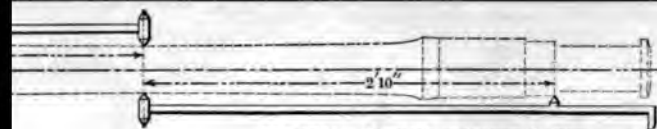


Fig. 2115. JOURNAL-SHOULDER GAUGE.

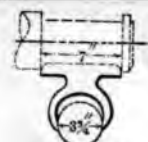


Fig. 2116.
JOURNAL LENGTH AND
DIAMETER GAUGE.

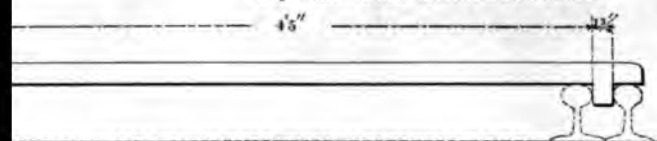


Fig. 2117. GUARD-RAIL GAUGE.

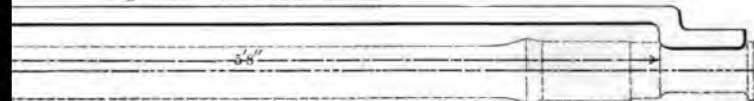


Fig. 2118. JOURNAL DISTANCE GAUGE.

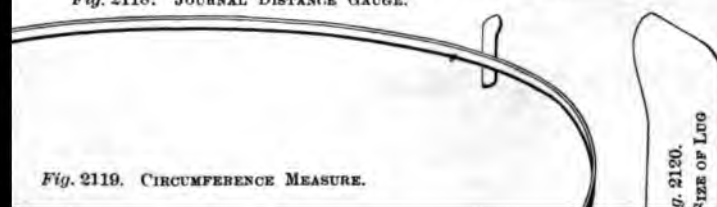


Fig. 2119. CIRCUMFERENCE MEASURE.



Fig. 2124.
Section.



Fig. 2125.
Back View.

WASHBURN WHEEL.



Fig. 2126.
Front View.
SPOKE WHEEL.



Fig. 2127.
Section.



Fig. 2128.
Front View.

HOLLOW-SPOKE WHEEL.



Fig. 2129.
Front View.

COOPER ELASTIC WHEEL.



Fig. 2130.
Section.

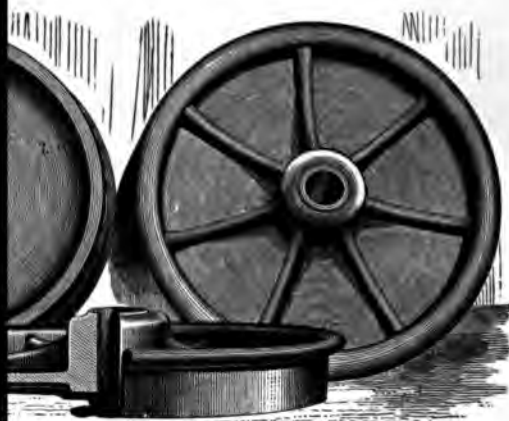


Fig. 2131.
SINGLE-PLATE WHEEL.

Front View.



Fig. 2132.
Section.
"COMBINATION"
SINGLE-PLATE WHEEL.



*Fig. 2137.
Back View.*

SINGLE-PLATE WHEEL, for Street Cars.



*Fig. 2138.
Front View.*



*Fig. 2139.
Back View.*

OPEN-PLATE WHEEL, for Street Cars.



*Fig. 2140.
Front View.*



*Fig. 2141.
HAND-CAR WHEEL.
(24 in. to 30 in. diameter.)*



*Fig. 2142.
HAND-CAR WHEEL.
(Weight, 20 in. diameter, 70 lbs.)*



*Fig. 2143.
WOODEN HAND-CAR WHEEL.
(18 to 24 in. diameter)*



Fig. 2144.

THATCHER CORRUGATED (SINGLE-PLATE) WHEEL



Fig. 2145.

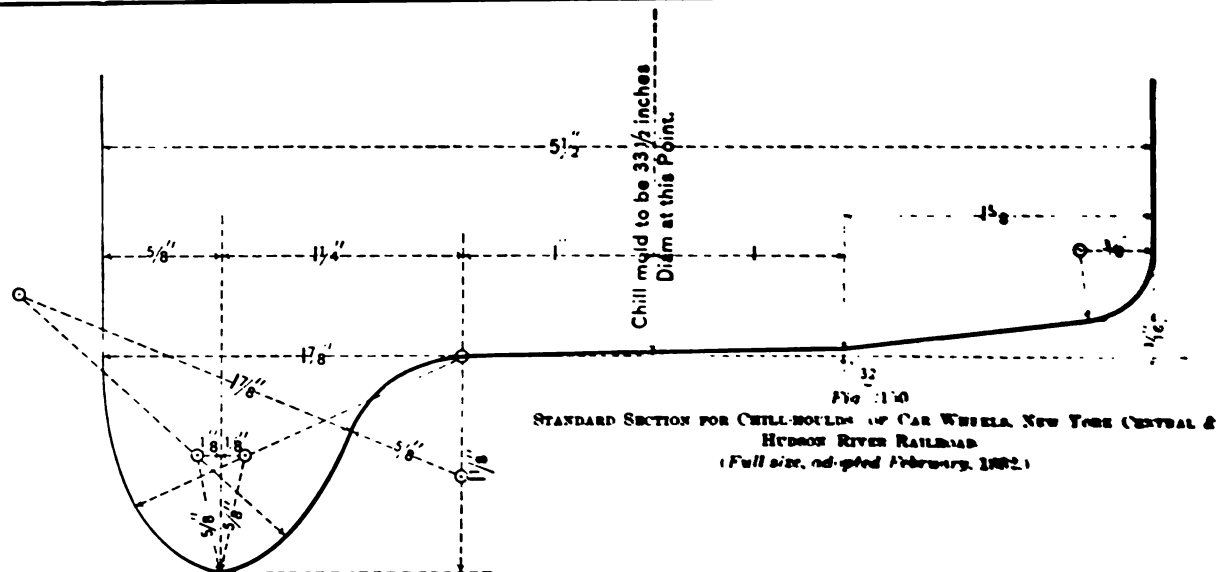


Fig. 2151. Side View.
ENGLISH TEAR-WOOD CENTRE WHEEL.

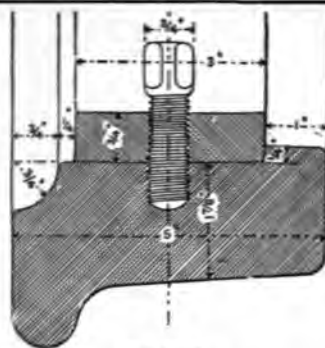


Fig. 2153.
SET SCREW OR STUD FASTENING.

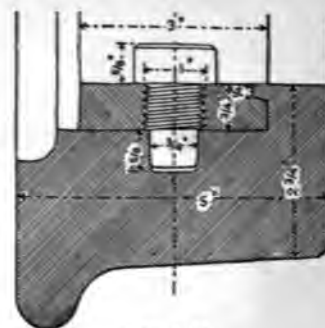


Fig. 2154.
SET-SCREW FASTENING (PLAIN END).

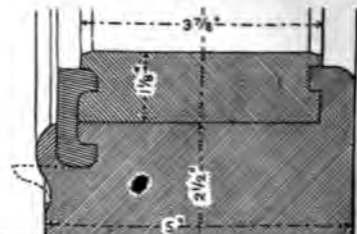
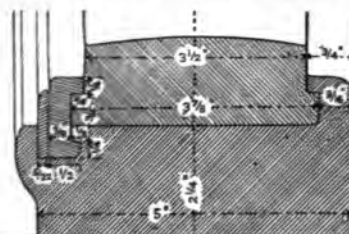




Fig. 2150.



Fig. 2160.



Fig. 2161.

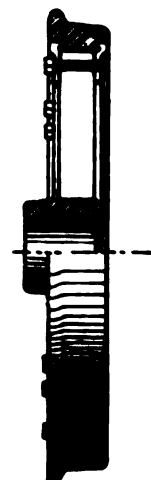


Fig. 2162.

Section and Side View of Fig. 2165.

Tire-bolt.
Hub-bolt.

Tire.
Compressed Paper.

ALLEN PAPER WHEEL.
NAMES OF PARTS.

Front Face-plate.
Back Face-plate.

Wheel-centre, or Hub.



Fig. 2163.

SNOW INTERCHANGEABLE-HUB WHEEL.



Fig. 2164.

NAMES OF PARTS:
Figs. 2163-64.

Tire, with Annular Web.
Mansell Retaining-ring.
Skeleton, or Central Filling-piece.
Front Face-plates.
Back Face plates.
Interchangeable Hub.

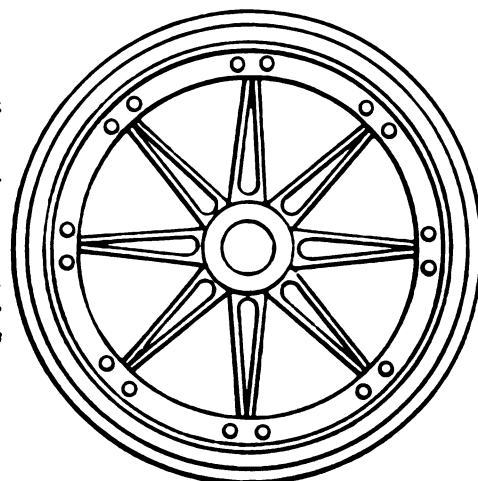


Fig. 2165.

KIRTLLEY DOUBLE-SPOKE WHEEL, WITH MANSSELL
RETAINING-RINGS.



Fig. 2107.
Section.



Fig. 2108.
Tire, Showing CORRUGATIONS and PITS.

NAMES OF PARTS ; Fig. 2107.

- A. *Steel Tire.*
- B. *Wheel-centre (cast-iron).*
- C. *Packing.*
- E. *Retaining-lip.*
- G. *Wheel-centre Flange.*
- H. *Cover-plate.*

EMP-PACKED WHEEL.

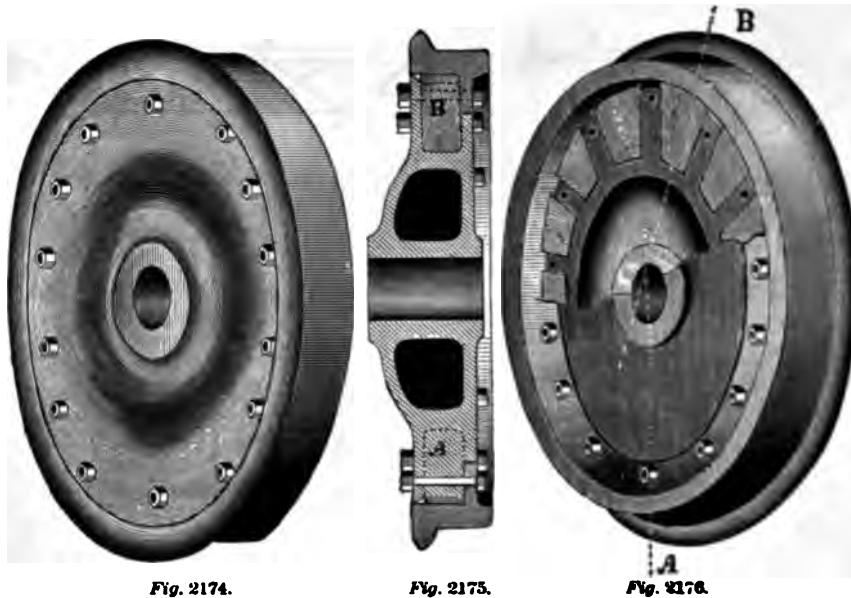


Fig. 2174.

Fig. 2175.

Fig. 2176.

THOMAS STEEL-TIRED WHEEL.

NAMES OF PARTS; Figs. 2174-76.

Tire, with Internal Flange.

Skeleton, or Wheel-centre.

Packing Blocks.

Packing-block Pockets.

Radial Arms.

Fig. 2177.
Section.Fig. 2178.
Front View.

STEEL WHEEL, with TIRE and MANGELL RETAINING-RINGS.
1. Retaining-ring. 2. Tire-bolt. 4. Wheel-centre. 5. Tire.

Fig. 2179.
Section.Fig. 2180.
Front View.

WROUGHT-IRON WHEEL, with TIRE. (Old Style.)
2. Tire-bolt. 4. Wheel-centre. 5. Tire.

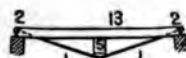


Fig. 2181.

KING-POST TRUSS.

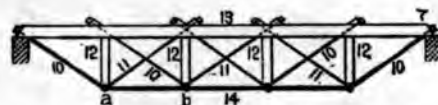


Fig. 2185.

PRATT OR WHIPPLE TRUSS.

(See also "Bastard Pratt" in Dictionary.)

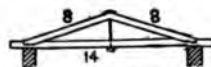


Fig. 2182.

KING-POST TRUSS.

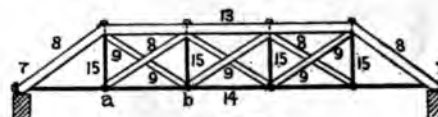


Fig. 2186.

HOWE TRUSS.

(See also "Bastard Howe" in Dictionary.)

[REDACTED]

.

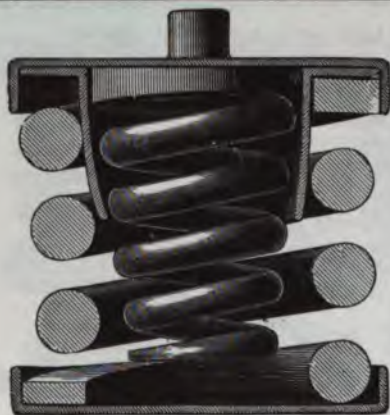


Fig. 2100.
DOUBLE-COIL GRADUATED BOLSTER-SPRING.
Capacity, 9,000 lbs., with $1\frac{1}{4}$ in. compression.
" 12,000 " " $1\frac{3}{8}$ " "
Total motion 2 inches.



Fig. 2101. DOUBLE-COIL GRADUATED
EQUALIZER-SPRING.

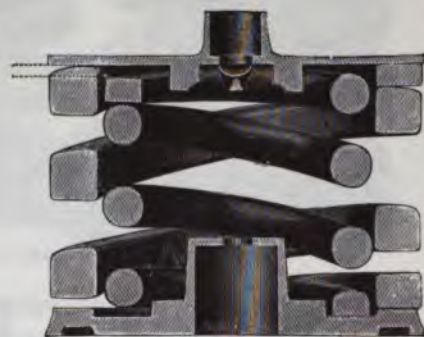


Fig. 2102.
DOUBLE-COIL GRADUATED BOLSTER-SPRING.

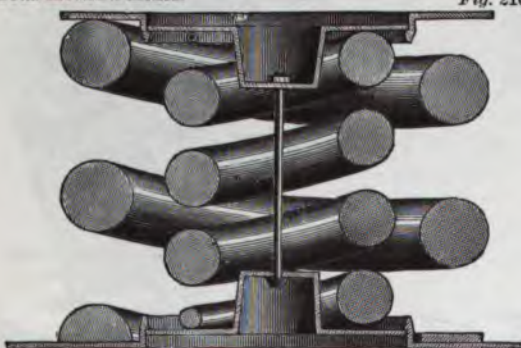


Fig. 2103. DOUBLE-COIL GRADUATED BOLSTER-SPRING.



Fig. 2105. THREE-GROUP GRADUATED BOLSTER-SPRING.

Graduated
Springs.



Fig. 2104. TRIPLE-COIL GRADUATED BOLSTER-SPRING.

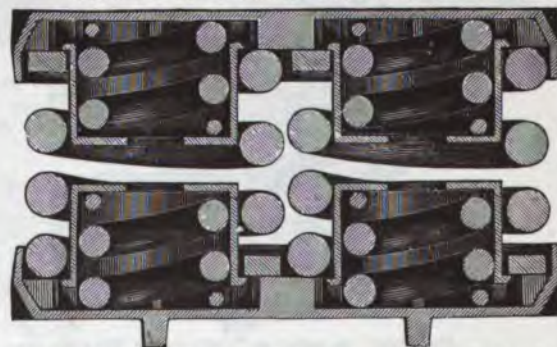


Fig. 2106. TWO-GROUP DOUBLE-COIL BOLSTER-SPRING, with Inside
Spring-case.

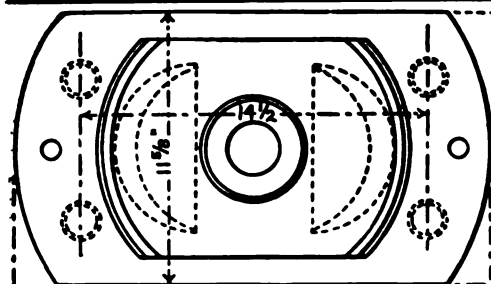


Fig. 2107.
Body Centre-plate.

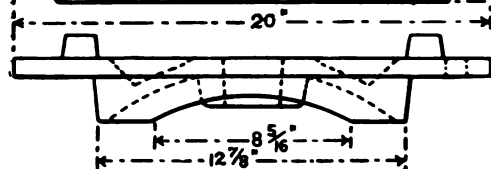
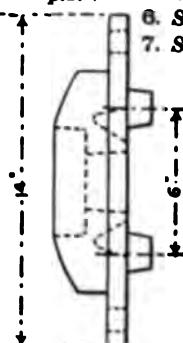
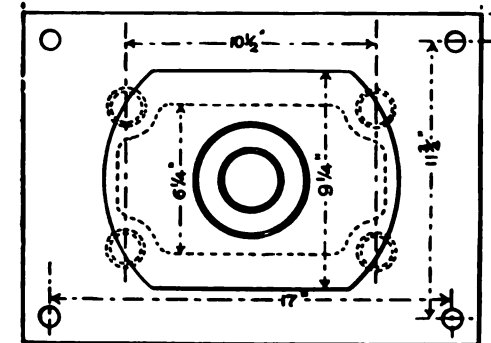
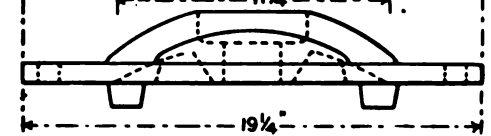


Fig. 2108.
Section of both
Centre-plates.



Fig. 2109.
Truck Centre-plate.



PULLMAN AND PENNSYLVANIA RAILROAD STANDARD PASSENGER CENTRE-PLATE.

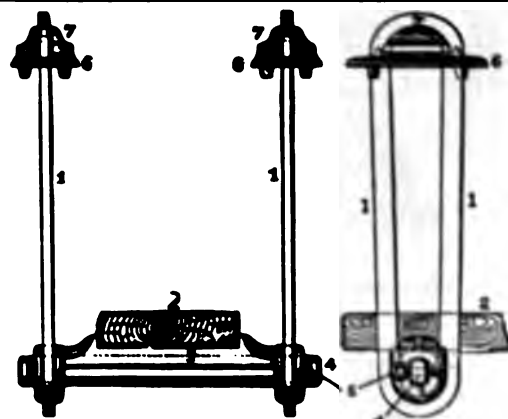


Fig. 2110.
SWING-LINKS AND ATTACHMENTS, LANE SHOOK & HICKMAN
SOUTHERN RAILWAY AND CONNECTING LINES.

NAMES OF PARTS : Figs. 2110-11.

1. Swing Link-hanger.
2. Spring-plank.
3. (Fig. 2110) Cross-bar Casting, or Spring-plank Carrier.
3. (Fig. 2111) Swing-hanger Friction-washer (lower).
4. Cross-bar, or Mandrel-pin.
5. Split-key.
6. Swing-hanger Upper Bearing.
7. Swing-hanger Friction-washer (upper).

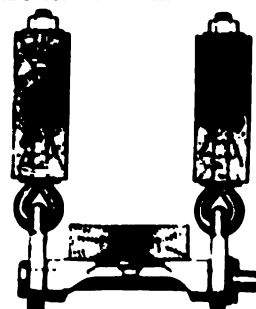


Fig. 2112. (Cross-section).

NAMES OF PARTS : Figs.
2112-13.

- Link-hanger Eye-bolt.
Link-hanger.

(Other parts as in Figs. 2110-11)

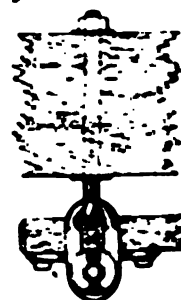


Fig. 2113. Side View.
EYE-BOLT LINK-HANGER.
(A SAFETY-SCREW, not shown, is
attached to the transverse end
piece under the spring-
plank.)

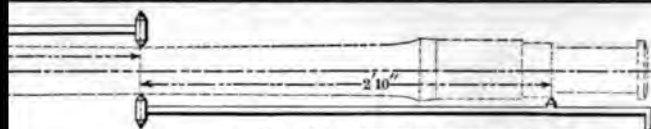


Fig. 2115. JOURNAL-SHOULDER GAUGE.

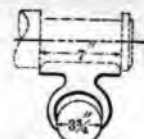


Fig. 2116.

JOURNAL LENGTH AND
DIAMETER GAUGE.

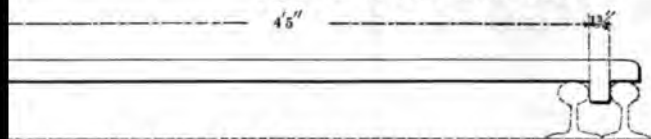


Fig. 2117. GUARD-RAIL GAUGE.



Fig. 2118. JOURNAL DISTANCE GAUGE.

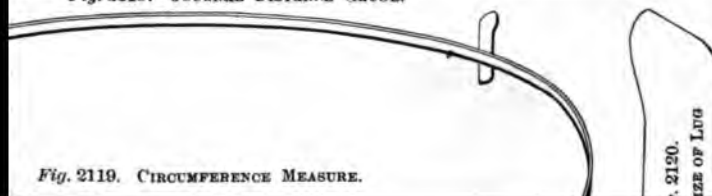


Fig. 2119. CIRCUMFERENCE MEASURE.



Fig. 2124.
Section.

WASHBURN WHEEL.



Fig. 2125.
Back View.



Fig. 2126.
Front View.
SPOKE WHEEL.



Fig. 2127.
Section.

HOLLOW-SPOKE WHEEL.



Fig. 2128.
Front View.



Fig. 2129.
Front View.

COOPER ELASTIC WHEEL.



Fig. 2130.
Section.

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Journal Bearings

FOR BOTH



*Fig. 2137.
Back View.*



*Fig. 2138.
Front View.*

SINGLE-PLATE WHEEL, for Street Cars.



*Fig. 2139.
Back View.*



*Fig. 2140.
Front View.*

OPEN-PLATE WHEEL, for Street Cars.



*Fig. 2141.
HAND-CAR WHEEL.
(24 in. to 30 in. diameter.)*



*Fig. 2142.
HAND-CAR WHEEL.
(Weight, 20 in. diameter, 70 lbs.)*



*Fig. 2143.
WOODEN HAND-CAR WHEEL.
(18 to 24 in. diameter.)*



Fig. 2144.

THATCHER CORRUGATED (SINGLE-PLATE) WHEEL.



Fig. 2145.

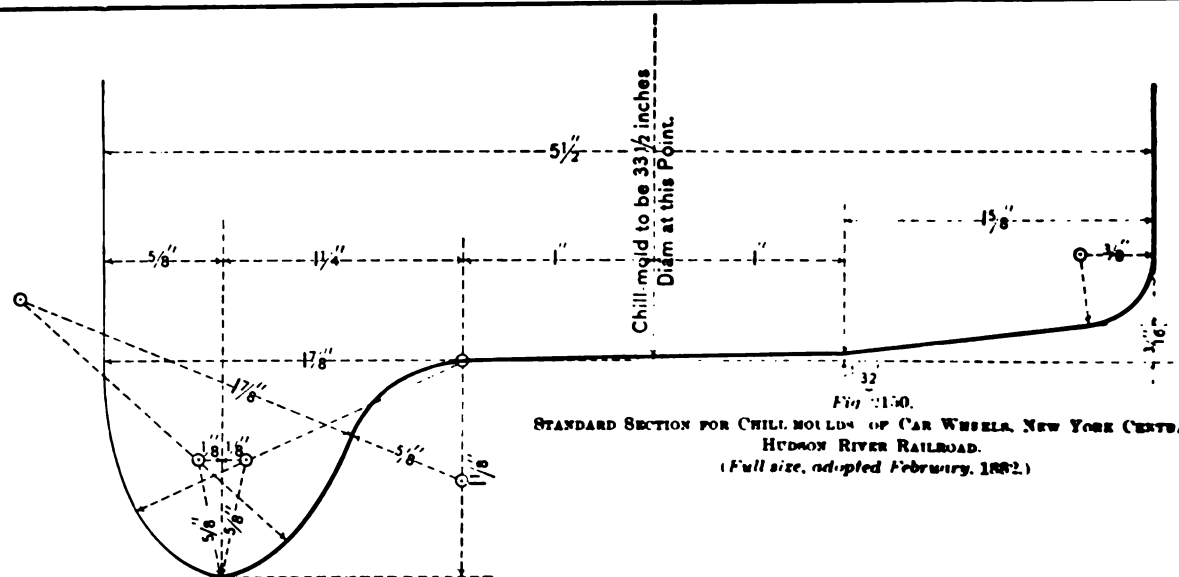


Fig. 2150.

STANDARD SECTION FOR CHILL Moulds OF CAR WHEELS, NEW YORK CENTRAL & HUDSON RIVER RAILROAD.
(Full size, adopted February, 1882.)



Fig. 2151. Side View.
ENGLISH TEAR-WOOD CENTRE WHEEL.

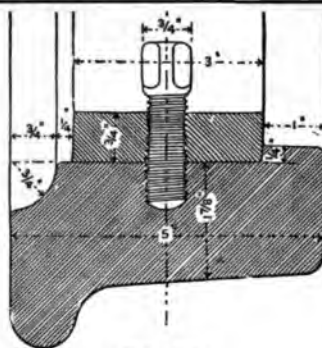


Fig. 2153.
SET SCREW OR STUD FASTENING.

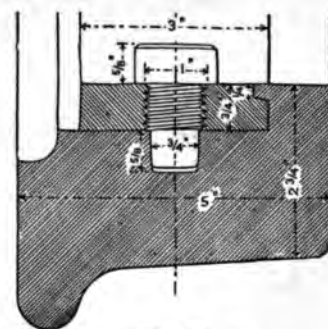


Fig. 2154.
SET-SCREW FASTENING (PLAIN END).

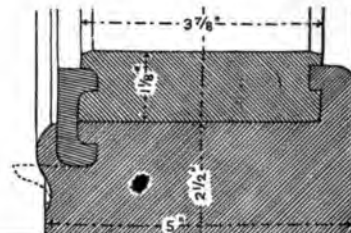
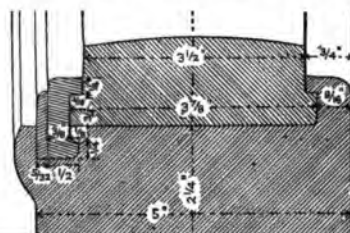




Fig. 2150.



Fig. 2160.

ALLEN PAPER WHEEL.

NAMES OF PARTS.

Tire-bolt.
Hub-bolt.Tire.
Compressed Paper.Front Face-plate.
Back Face-plate.

Fig. 2161.

Wheel-centre, or Hub.

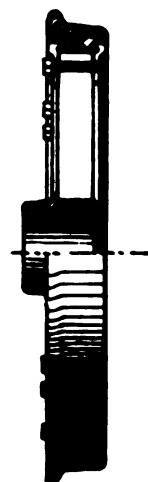


Fig. 2162.

Section and Side View of Fig. 2160.



Fig. 2163.

SNOW INTERCHANGEABLE-HUB WHEEL.



Fig. 2164.

NAMES OF PARTS;
Figs. 2163-64.

Tire, with Annular Web.

Mansell Retaining-ring.

Skeleton, or Central Filling-piece.

Front Face-plates.

Back Face plates.

Interchangeable Hub.



Fig. 2165.

KIRTLAY DOUBLE-SPOKE WHEEL, WITH MANSSELL RETAINING-RING.

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8 "	Illinois Central	6 "	Old Colony R.R.....	5 "

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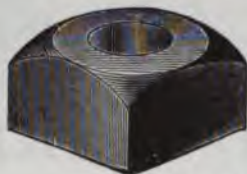
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MANUFACTURERS OF



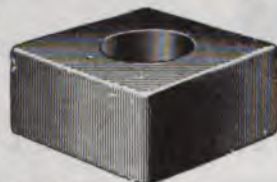
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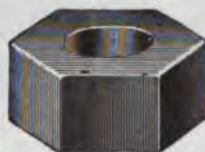
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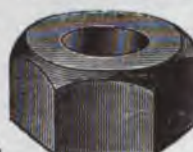
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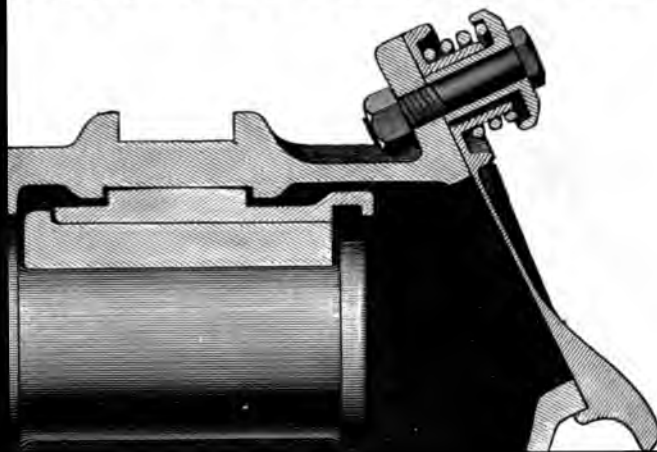
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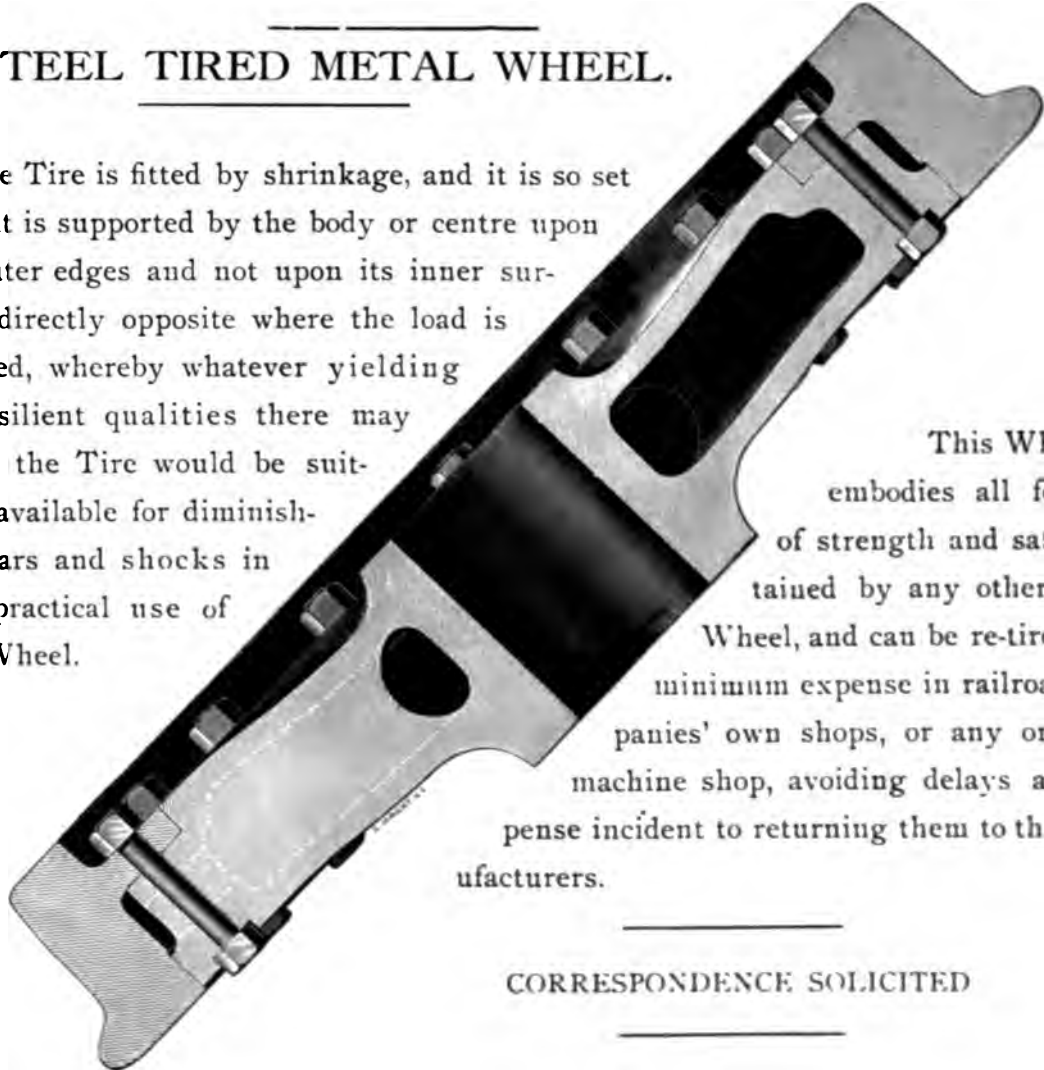


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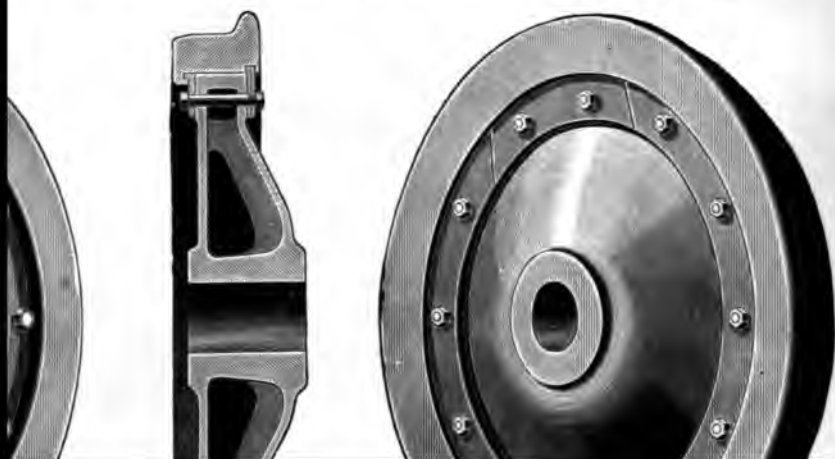
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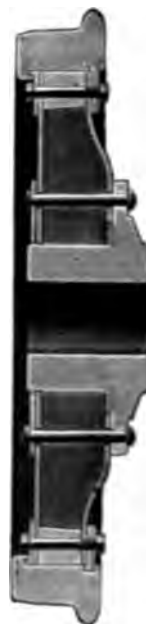


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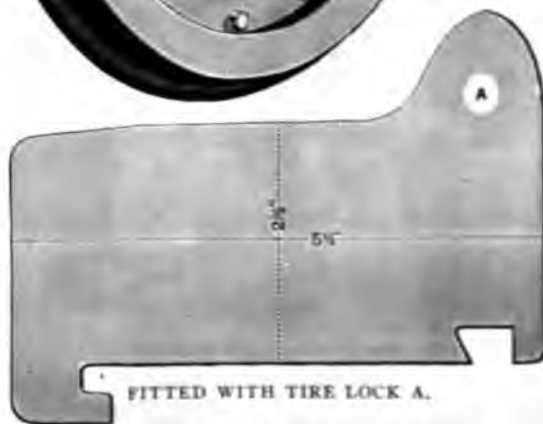


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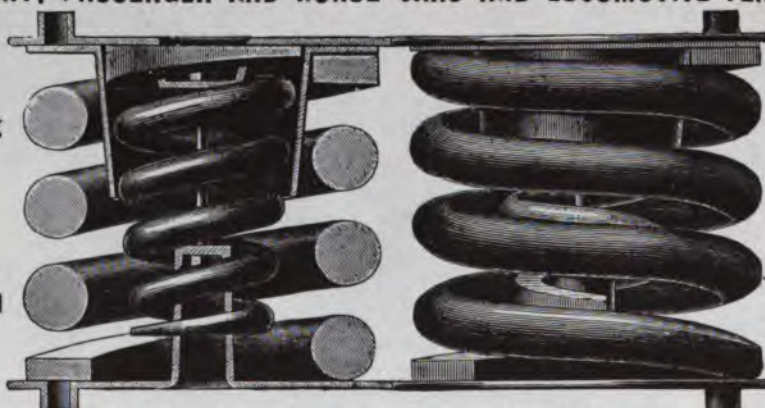
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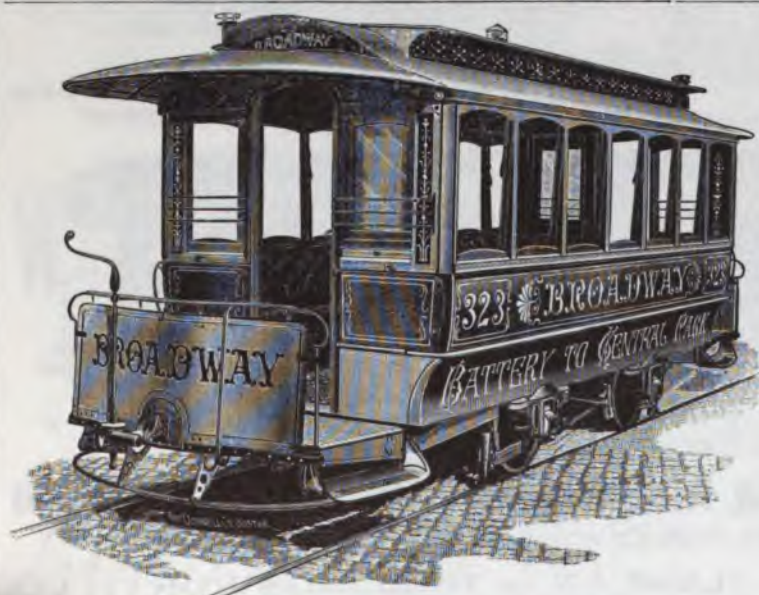
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